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Kelly Jollath © 1980

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THE COVER: In the early 1900s, the antelope (front cover illustration: Kelly Vollrath) was considered finished as a game animal. Today, antelope are second only to white-tailed and mule deer as the most numerous big game animal in the United States. In spite of habitat loss, pronghorns now thrive and have been restored to most of their suitable range. They also provide the only chance most Americans ever have for a big game hunt on the prairie. For some suggestions on antelope hunting, turn to Bart O'Gara's article, "Play by the Rules and Enjoy the Game," on page 27. Harry Engels' back cover photo of a regal bugling elk serves as an appropriate introduction to a five-page showcase of his work, beginning on page 18. From the snowy egret to the Shiras moose, we're certain you'll "Enjoy!" Engels' painstaking photographic efforts.

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The Editor's Column

"At least in angling circles, Montana is probably as well known for its rivers as for its mountains, for its streams as for its national parks and for its spring creeks as for its wide-open spaces," writes Larry Peterman in his article "Water for the Future," beginning on page 2. People from all over the country flock by the thousands every summer to rivers like the Yellowstone, the Madison, the Gallatin and the Big Hole to fish, float and enjoy the sage-scented air and western scenery. They return home—many to states with a far greater abundance of water—singing the praises of Montana's mountain-fed rivers and blue-ribbon trout streams.

Yet, what many of these people don't realize is that Montana is a water-poor land. Certainly not poor in quality, but poor in quantity. Not all of Montana, but most of it. The state lies well to the west of the hundredth meridian, the generally acknowledged dividing line between the humid lands of the eastern United States and the arid and semiarid lands of the West.

As scientists since the days of Major John Wesley Powell—director of the U.S. Geological Survey In 1881—have pointed out, the West is an arid and fragile place. Land use practices and principles that work in more humid climates simply don't apply beyond the hundredth meridian. Whenever we temporarily forget that basic fact, Mother Nature reminds us with a drought that blisters the prairie grass and sends a cloud of Montana topsoil winging toward the Mississippi.

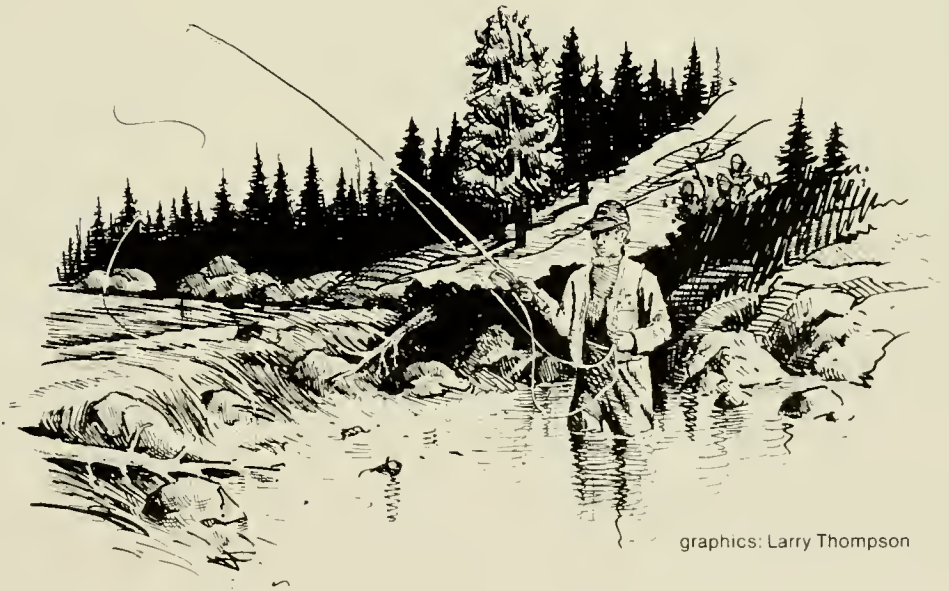
One would think, then, given the importance of water in Montana, that steps would long since have been taken to protect and nurture the state's rivers, streams and lakes. But this has not been the case. Most of the legislation protecting Montana's waterways from

pollution, stream bank and channel alteration, and overuse is relatively recent in origin. And the complicated process of adjudicating all water rights claims and quantifying water use within Montana's boundaries is only now taking place.

What does this mean to Montana's fish and wildlife? It means good things, if Montanans continue to show the strong commitment to wise water use that they have demonstrated over the past decade. In 1969, the Montana Legislature passed an act allowing the Fish and Game Commission to file for the unappropriated waters of 12 streams (or portions of them) in amounts necessary for preservation of fish and wildlife habitat. And in

system of water law: water dispensed on a first-come, first-served basis, with no safeguards against overuse of rivers and streams. It will continue to be attacked by people who choose to ignore the essential fact of Montana's aridity, or who choose to place short-term gain above the long-term well-being of the state.

The old system of unlimited water withdrawals worked fine as long as the state's population remained small and the demands on its waters were few. But a century of unrestricted depletion has taken its toll, and today we must have constraints on water withdrawals from certain waterways, not only to protect fish and wildlife, but to protect the rights of existing water



graphics: Larry Thompson

1973, the Legislature passed the Montana Water Use Act which, among other things, recognizes fish and wildlife as beneficial users of water and allows them to compete for the unallocated surface waters of the state.

Not surprisingly, this law has been attacked by those who would like to see Montana revert to the old

users. To do otherwise would be to disregard the lessons of the past and to jeopardize the promise of the future.

As Peterman says in the conclusion to his article, "Montana rivers can be preserved if you care enough to ensure that the law being used to protect them is also preserved."—*Dave Books*



Water for the Future

by Larry Peterman

AT LEAST in angling circles, Montana is probably as well known for its rivers as for its mountains, for its streams as for its national parks and for its spring creeks as for its wide-open spaces.

Rivers are as much a part of Montana's heritage as the state's colorful history and abundant natural resources. They provided the early routes to funnel trappers, traders and settlers into a virgin territory and to return the pioneers' trading stock downstream to eastern markets. Settlement followed the water courses, and as railroads gradually replaced rivers as the major means of transportation, Montana rivers assumed new roles as providers of water for fish, wildlife, cities, agriculture, hydropower and recreation. These roles continue, and, in many parts of the state, rivers provide not only a heritage, but the promise of life-sustaining water for the future.

If rivers are so much a part of our state, it may come as a surprise to learn that, until recently, little protection was available for our waters. Rivers were polluted; their channels were bulldozed and straightened, and their waters were drained away. Adequate water pollution statutes were not enacted until 1969, and then enforcement was often a problem. Protection from gross stream bank and channel alteration did not occur until 1963, and then the law applied only to government agencies. Not until 1975 were private individuals included under similar legislation. Perhaps the most important—and difficult—aspect of protecting rivers is protecting the water itself.

Quality fishing on Montana's streams and rivers, such as the Gallatin (left), depends largely on the quantity of water in that stream (photo: Paul Updike).

In Montana, as in most semiarid areas, competition exists for the use of limited supplies of surface water and Montana's rivers supply many, many uses—irrigation, industry and municipal water supplies. Some rivers supply water to grow crops, while others cool a coal-fired generating plant. These are called *consumptive* uses of water, and refer to diverting a certain amount of water from the stream and using all or part of that water.

In contrast, a major *nonconsumptive* use of Montana's rivers is for recreation—fishing, hunting, floating, agate hunting, bird-watching, camping. From a recreational standpoint, the quality of that river experience, fishing or floating or whatever, depends largely on the quantity of water in the stream.

As you stand on the banks of a river, the water flowing by is what biologists call instream flow. Instream flow simply refers to the water flowing in a stream at a given time. Certain values are associated with this instream flow. Some of the obvious values include fish, wildlife and recreation; however, other valuable assets of instream flow include water quality, sediment transport, hydro-power production and irrigation.

Minimum instream flow refers to a certain amount of water necessary to maintain one or more of those "values" at acceptable levels. While most people will not argue that some water should be left in the stream, the amount is quite another matter. The amount depends on the value to be preserved and the level of maintenance. A substantial amount of water in a river is likely to produce good to excellent fish populations; a modest amount of water will probably provide average fish popula-

tions, while a small amount of water left instream will probably result in poor fish populations. In other words, it takes more water to produce large numbers of brown trout to provide an excellent stream fishery, than simply to keep a few suckers or carp alive.

Let's take a closer look at some of the values and examine the importance of the amount of water left instream. We'll start with fish. Just as we need air to breathe, a fish needs water to stay alive. Remove the water from a stream for just one day, and it really doesn't matter how much flows for the rest of the year. Stream fishes require adequate flows from the minute eggs are laid. Spawning gravels must be kept clean and free from silt, and fresh water must be supplied to the eggs as they lie developing in the redds (nests). After hatching, water carries the larval fish to secure areas where they grow into fingerlings, juveniles and finally, adults (a process called "rearing").

Summer and early fall are periods when fish put on most of their yearly growth. Water temperatures are sufficiently warm for growth and food organisms are especially abundant. Adequate flows during summer and fall make sure that summer temperatures do not become too high for growth or survival, and the major food-producing areas—the shallow riffle areas of a river—are covered with enough water to provide adequate crops of aquatic insects. On some rivers, especially those with heavy nutrient loads, adequate summer flows prevent levels of dissolved oxygen from becoming too low.

Winter is a time of stress for most fish populations. Often ice forms along the banks and sometimes a river or stream freezes over complete-

ly. Anchor (bottom) ice may form in riffle areas, reducing insect production and hiding spaces for small fish. Slush ice can concentrate in slow-moving portions of the river and eliminate large portions of habitat. The highest natural mortality normally occurs during winter (overwinter mortality). Adequate winter flows minimize stress on the fish and increase overwinter survival.

As the fish grow to adults, they again seek out spawning grounds with the proper depth and velocity of water. While some fish live and reproduce in a short reach of river, others migrate long distances to reach traditional spawning areas. Some fish species, such as the paddlefish, wait for the first surge of high water before they begin their annual trek. Without that high water, few would migrate, and those that did would have trouble passing over shallow riffles or long rapids on their upstream journey.

The spring high water also flushes out the year's accumulation of sediments. These sediments must be flushed from spaces between the river gravels, particularly in riffle areas, to maintain good insect production and clean spawning areas for next year's crop of young fish. High water is the driving force that reshapes the river gravels and rebuilds midstream gravel bars and islands. In all, high flows may be among the most important of the year in maintaining the shape and form of Montana's rivers as we know them today.

Animals other than fish also depend on the rivers' waters. During March and April, flow in side channels must be sufficient to keep the nesting islands of Canada geese isolated from nest-robbing predators. Beavers need winter flows to keep their caches from freezing solid, and a host of game and nongame wildlife depend heavily on shoreline (riparian) habitat which is influenced by stream flow.

So far, we have talked mostly about minimum instream flows as they relate to fish, wildlife and recreation. There are, however, other important benefits of adequate stream flow. Water quality is a good example. The quality of water in a river is related to the amount of water flowing in that river. If a river carries pollutants, that load will be more



A major nonconsumptive use of Montana's rivers is recreation—fishing, hunting, floating, agate hunting, bird-watching, camping. Here, floaters enjoy a trip down the Blackfoot River (photo: Tony Caprio).

concentrated at low flows than at high flows. Generally, the lower the flows, the poorer the water quality. If the water is to be used for drinking, poor-quality water necessitates greater treatment and higher costs at water treatment plants.

Agricultural interests have as much at stake in maintaining adequate instream flows as the fisherman does. Adequate instream flows ensure that an existing water user will be able to obtain his water without altering an existing diversion structure. Take for example the Yellowstone River at Miles City. During the recent Yellowstone water reservation hearings, the North Custer County Conservation District requested (and was granted) an instream flow reservation of 4,000 cubic feet per second (cfs) to maintain an adequate head for diversion purposes at its Kinsey pumping plant. Instream flows provide a buffer between the current existing irrigator and future water users.

Agriculture also needs a certain quality of water. Some rivers become too saline at low flows and require changes in cropping patterns, or changes in water application rates and techniques. At best, this is a nuisance. At the worst, it can be a devastating additional cost and lead

to crop and soil damage. Adequate stream flows also assure that existing hydropower projects can be operated at or near their maximum capacity. With energy becoming more valuable, it makes little sense to jeopardize existing hydropower capacity.

If so much depends on adequate instream flows, why are some of our streams badly dewatered and others similarly threatened? Because, quite simply, Montana's rivers have been totally vulnerable to unrestricted depletion for over 100 years. Traditional western water law, steeped in the pioneer tradition of taming the frontier, actually encouraged the exploitation of our waters. Such encouragement was logical when people were few and water was plentiful. But problems arose when Montana changed, and the water law did not. One hundred years of water use under the old water law eventually took their toll, and many rivers had more water appropriated from them than could be found in certain sections during low flow. Most vulnerable were those small tributaries which come out of the mountains and feed larger rivers.

Once these tributaries leave the mountains and enter the broad, fertile valleys, most of their water is removed for irrigation. What seems a minor water withdrawal on a large river becomes a major withdrawal on a small tributary. Hence, the first waters to suffer from severe dewatering were small tributaries. However, major rivers were ultimately to suffer from overappropriation and overuse of their waters. The Shields, West Gallatin, Big Hole, Jefferson and Bitterroot all have sections which become severely, if not totally, dewatered during low flow years. During extreme drought, even the mighty Yellowstone suffers from drastically reduced flows in its lower reaches.

By the mid-1950s, department fisheries personnel and local conservation groups began to recognize that dewatering was a major problem in some areas, and believed it would worsen. To prevent other streams from becoming dewatered and to help those that were, conservationists examined the old water law for methods of relief. Results, however, were disappointing.

Two major obstacles in the old water law prevented instream flow protection for fish and wildlife. First, water could only be appropriated for a beneficial use and fish and wildlife were not specifically recognized as beneficial users of the water. In addition, before water could be put to a beneficial use and appropriated, it had to be diverted from the streambed. Even if fish and wildlife had been considered beneficial users, the diversion requirement would have hampered any attempt to preserve instream flow values. Under the old water law, little could be done to protect instream values.

In the early 1960s, serious efforts were initiated to obtain beneficial use status for fish and wildlife and to develop a method for keeping water in the streams to meet fish and wildlife needs. These early efforts were largely unsuccessful.

In Montana, the first instream flow consideration was given to fish and wildlife by the 1969 Montana Legislature with passage of an act allowing the Montana Fish and Game Commission to file for the unappropriated waters of certain streams in the state in amounts necessary for preservation of fish and wildlife habitat. Twelve streams or portions of those 12 streams were named in the act. The list reads like a litany of nationally famous trout waters: Big Spring Creek; Blackfoot River; South, Middle and North forks of the Flathead River; Gallatin, West Gallatin, Madison, Missouri, Smith and Yellowstone rivers, and Rock Creek—12 of the best trout streams in Montana, and all enjoying national reputations.

In 1970 and 1971, the Montana Fish and Game Commission filed for instream flow rights on all 12 streams. Today, *bona fide*, valid instream flow rights have been established on these streams. But under the statewide water adjudication process, the instream rights have to be refiled by Jan. 1, 1982. During adjudication, instream uses of fish, wildlife and recreation will be considered concurrently with consumptive uses.

While the 1969 law offered a certain amount of protection for these 12 streams, it did little for the rest of Montana's waters. Clearly, the old water law required major revision.

This was accomplished in 1973, and the resulting legislation was called the Montana Water Use Act. This act contained several features important to preservation of instream flows for fish and wildlife. It also overcame two chronic problems which plagued conservationists for years. First, fish, wildlife and recreation were specifically recognized as "beneficial users" of water. Second, a procedure was developed to secure water for instream purposes. No longer was it necessary to divert water before it could be put to a beneficial use. Instead, water could be "reserved" for fish and wildlife and left in the stream channel to maintain a minimum flow.

This was a major breakthrough for those concerned with preserving Montana's rivers. For the first time, fish and wildlife as beneficial users of water could receive protection and recognition under water law statutes and actively compete for unallocated surface waters of the state. No longer did they have to merely accept what was left over.

The reservation section of the Water Use Act was not destined to lie around gathering dust in some neglected law library. Rather, oil embargoes and energy crises led to massive filings by industry for the lower Yellowstone's water. This prompted a moratorium on large water diversions and eventually resulted in the allocation of the surface waters of the Yellowstone Basin using the reservation section of the Water Use Act. (Additional articles about Yellowstone flow reservations appeared in the July/August 1976, May/June 1978 and March/April 1979 issues and in the Yellowstone Special Issue of February 1977.) The upshot was 5.5 million acre-feet of water committed to the Yellowstone at Sidney.

While the Yellowstone reservation was hailed as a major victory for river conservationists and the Water Use Act looked upon as a means of protection for other drainages, opponents saw things quite differently. The 1976 legislative session saw an attempt to prioritize water use with a preference system, putting fish, wildlife and recreation on the bottom rungs of the ladder. If this legislation had passed, it would have made little difference how much water were reserved for fish and wildlife, because

they would have been at the end of the line. An equally serious attempt was made in the 1979 session to destroy both the Yellowstone reservations and the reservation portion of the Water Use Act.

Opposing interests would have the Water Use Act revert to the old style water law—no provisions for instream flow; water dispensed on a first-come, first-served basis, and a "let's get back to business as usual" attitude. Only when there was no longer any water left would water no longer be available for appropriation.

The Water Use Act is a reasonable, workable document, contrary to what the opponents claim. The policy statement for the Water Use Act says it is the policy of the state to "encourage the wise use of the state's water resources by making them available for appropriation consistent with this act and to provide for the wise utilization, development and conservation of the waters of the state for the maximum benefit of its people with the least possible degradation to the natural aquatic ecosystem."

The Water Use Act does, in fact, provide the means to develop "the waters of the state for the maximum benefit of its people with the least possible degradation to the natural aquatic ecosystem." Inevitably, constraints must be placed on water consumption in certain basins or on certain waters. To accomplish the above-stated policy, the tradition of freely issuing water permits until no water is left must be altered.

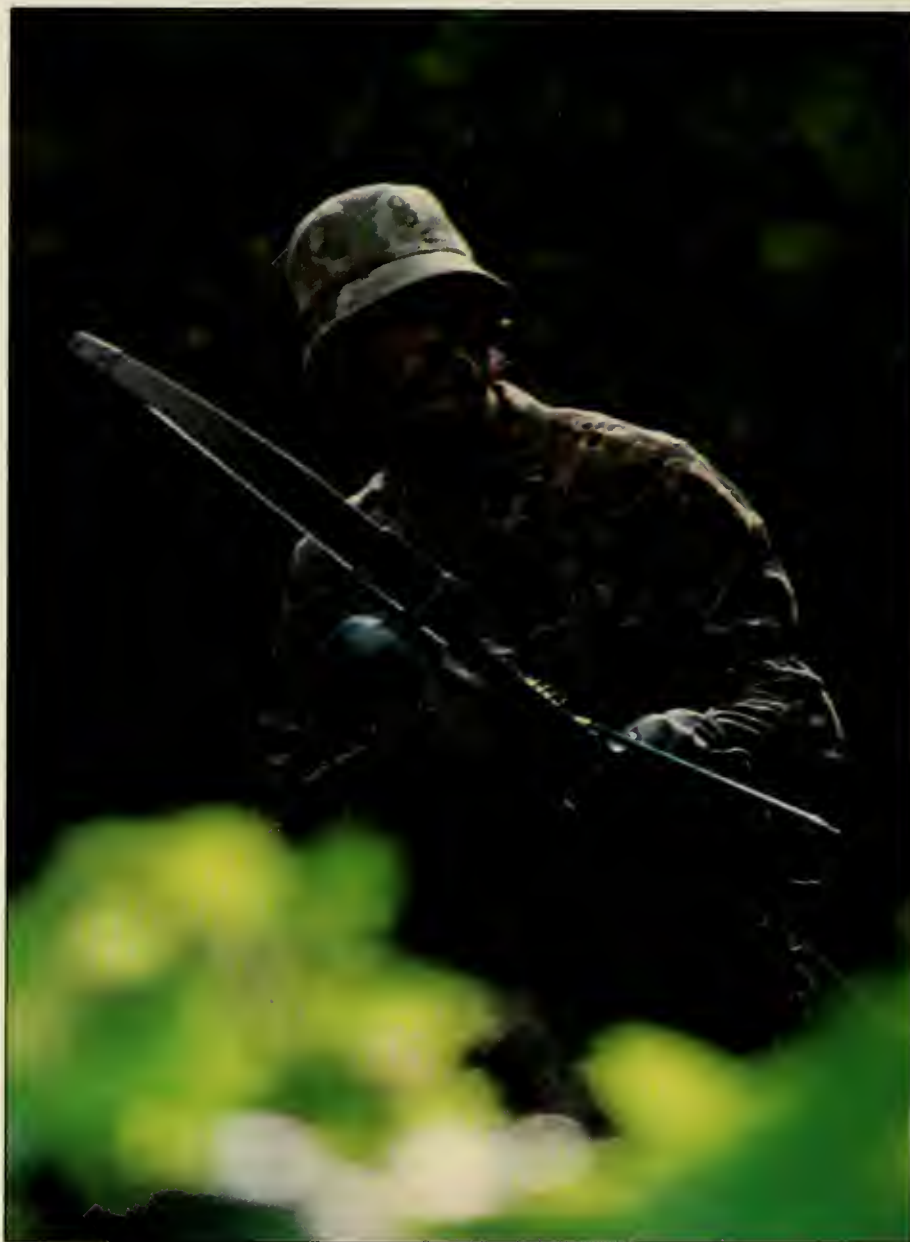
There are limits to the amount of depletion tolerable on a stream. Previously, lack of water constrained new water developments and rivers had to be virtually dry at certain times of the year before serious thought was given to withholding water permits. Now, with instream flows guaranteed, constraints to water use will come about before streams are totally depleted, benefiting not only fish, wildlife and recreation, but also existing water users.

It is the only reasonable thing to do, and the reservation section of the Water Use Act provides the means to do it. Now is not the time to sit idly by while the storm clouds gather on the horizon. Montana rivers can be preserved if you care enough to ensure that the law now being used to protect them is also preserved. ■

PEOPLE ARE attracted to bowhunting for many reasons. For some it is perhaps an ancient urge to pit their physical skill against the keen senses of a wild animal, or even a way to escape the problems and pressures of the present by turning back the clock to a time when the bow was a means of survival. For others, it may be the aesthetic appeal of pursuing a deer or elk against a backdrop of breathtaking mountain scenery. Still others are attracted by the naturalness and simplicity of the bow and arrow itself, an invention which can be traced back thousands of years through the cave paintings of our hunting ancestors.

Whatever the reasons, bowhunting is growing in popularity, both in Montana and across the United States. The number of archery licenses sold in Montana increased from about 2,000 in 1967 to more than 11,000 in 1979. This rapid influx of newcomers to the sport has spurred the formation of many bowhunting organizations as well as a National Bowhunter Education Program. This course, which is offered in Montana, emphasizes 15 "hows" of bowhunting, ranging from responsibilities and ethics to actual field experience. The books and materials for the course are provided, through the Pittman-Robertson tax on archery equipment, by the Department of Fish, Wildlife and Parks, and the course is taught by certified instructors who are experienced bowhunters. Further information can be obtained by writing Bob Bird, Dept. of Fish, Wildlife and Parks, Helena, MT 59601, or Don Hettinger, State Bowhunting Education Chairman, P.O. Box 168, Three Forks, MT 59752.

When one becomes interested in bowhunting, the first question that arises is, "What kind of bow should I buy?" The possibilities include longbows (straight bows), recurves and compounds. The straight bow—which, when unstrung, has no curves at all—is light, but maximum weight must be held at full draw (draw weight is the force required to draw the bowstring to the proper arrow length). The recurve bow is more or less straight to about a half-foot from the ends, then curves sharply out, away from the shooter. Although a little more expensive than a straight



“Hunting the Quiet Way”

**If your preferences run toward
golden autumn days and quiet stalks
through the woods—and if
bagging an animal isn't your primary
measure of success—bowhunting
may just be the sport for you.**

by Don Hettinger and Judy Casanova



By camouflaging himself (left), the bowhunter can get close to his quarry without being detected (photo: Wyman P. Meinzer Jr.; courtesy *Texas Parks & Wildlife* magazine). Bowhunting paraphernalia (above) includes a tackle box for storing gear, an arm guard, shooter's glove, hip quiver, camouflage paint, broadhead sharpener and a compound bow (photo: Glen Mills; courtesy *Texas Parks & Wildlife* magazine).

bow, the recurve can be built shorter for greater maneuverability in brushy hunting spots. The compound bow, a relatively new development, has become extremely popular in the past few years. It includes a block and tackle with pulley arrangements, allowing the shooter to handle a heavier draw weight. This design offers adjustable power settings and the freedom to use arrows of virtually any length. The disadvantages of this type of bow are that it weighs more and has more mechanical parts which can malfunction.

Whatever type of bow is chosen, the weight should be selected carefully. The neophyte bowhunter should shoot the heaviest bow that he or she can shoot *accurately*, in order to get the necessary penetration for a quick, clean kill.

After choosing a bow, the next decision is the choice of arrows. Wood, fiberglass and aluminum are the materials used to make arrow shafts. Cedar is the wood most fre-

quently used, because of its lightness and good sectional density. Fiberglass arrows are tubular, strong, durable and always straight. Aluminum shafts, also tubular, can be straightened if bent without posing a safety hazard. Arrows are fletched with plastic vanes or feathers. Plastic vanes can better withstand rough treatment and bad weather, but feathers are more forgiving when passing over the arrow rest of the bow. Hunting arrows should be tipped with *razor-sharp* broadheads, allowing quick and humane killing of game animals. Broadheads that use razor blade inserts are the easiest to keep sharp, since replacement blades can be carried along and inserted after each shot. Other types of broadheads must be sharpened by hand; the tools required are a file, stone, steel and leather strop. Remember, once a broadhead has been shot it must be resharpened or fitted with new blades.

The arrow quiver is an important part of the bowhunter's equipment; it

should protect the broadheads from being dulled by contact with grass or brush, and also protect the hunter from being cut by his arrows. Three types of quivers are commonly used: the bow quiver, which attaches directly to the bow; the hip quiver, which attaches to the belt, and the back quiver, which is supported by a strap over the shoulder. If a quiver does not cover the blades of the broadheads, it is unsafe.

Because the bow is most effective at short range, the bowhunter depends on getting in close for a shot. To avoid detection he must be absolutely still and blend in well with the background. Stalking quietly is a skill requiring patience and a good deal of practice; avoiding detection can be best accomplished through the use of camouflage. Several different patterns and colors of camouflage are available, each suited to a different terrain. Amoeba-shaped splotches in contrasting shades of brown are best suited to the dry grasslands, while

combinations of green and black work well in forested areas. Besides his clothing, the bowhunter's hands, face and equipment should also be concealed. A thin netting can be used for the face and hands, but this may interfere with shooting. Camouflage paints, charcoal or mud can also be used to break up the white reflection of the face and hands. Even a beard will help and, as a fringe benefit, it will also keep your face warm on cold mornings! For the bow, camo paint is available which can be sprayed into any pattern or color combination desired. This paint doesn't harm the bow and can be removed with a special cleaning compound. Tape can also be used, although it may be more difficult to remove.

Even when fully camouflaged, the bowhunter must take care not to silhouette himself or make sudden movements. Animals can spot movement of even a well-camouflaged hunter, and the snap of a twig can alert animals a considerable distance away.

The investment in bowhunting equipment will ordinarily range from \$150 to \$300. Camouflage clothing can be made at home with a little ingenuity, but the bowhunter shouldn't take shortcuts on the rest of his equipment. A bent arrow or a poorly constructed broadhead can only mean failure for the hunter and possibly misery for the hunted. Equipment should be purchased from a reputable dealer—one familiar with the equipment he sells and able to service it—preferably someone who is himself a bowhunter. Such a dealer will be better able to give sound advice on equipment and its use, particularly on some of the smaller items like armguards and finger protectors.

Once the proper equipment has been purchased, practice and preparation can begin. A good deal of practice is necessary to become proficient with a bow, but it's not as difficult as many people believe. The first few practice sessions should be kept short, as muscles will tire quickly. Be sure to have a safe backstop—straw bales or layers of cardboard work well and allow for long arrow life. When shooting at a target, learn to pick a spot about the size of a half dollar. Shoot from different distances ranging between 10 and 50 yards, and



If you plan to hunt from a tree stand, you should practice shooting down—the tendency is to shoot over an animal's back from this position (photo: Tom Wilcox).

vary your position. A good practice routine, for example, might be to shoot an arrow from a standing position at 20 yards, then move up to 10 yards and shoot an arrow from a kneeling position, then move back to 30 yards and shoot an arrow from an elevated position. Practice from elevated positions is essential if you plan to hunt from tree stands; a step ladder makes a handy platform to practice from. You should also practice under field conditions, and while wearing your normal hunting attire. Shooting at dirt clods, stumps, clumps of grass, etc. will help you learn to judge distance, and it will also reveal your accuracy limitations at varying yardages. Before hunting season starts, you must know how far you can shoot at game with confidence and accuracy.

Learn to shoot well under pressure if you can; competitive shooting, even just informal competition among friends, will help you in this regard. When that bull elk finally comes into view, your heart will begin to pound, your knees will become weak, and

your hands will be shaky. The only way to counteract this universal affliction is by practicing enough to have confidence in your ability and by learning to concentrate on that spot behind the shoulder of the animal. The tendency is to look at the whole animal instead of picking a spot, which often results in shooting over the animal's back. When shooting from a tree stand, the tendency is also to shoot high.

At times, the bow must be held at full draw for a short period—for example, when a deer decides to move behind a tree just as the bow is brought to full draw. If the deer's head is out from behind the tree, the bowhunter must hold and wait for the deer to take the next step in order to place an arrow in the vitals. Any movement at this time would give away the bowhunter's position and alarm the deer. At times like this, physical conditioning becomes especially important. Push-ups, sit-ups, jogging and other forms of exercise will keep the muscles strong enough to do the job required of them.



There are many types of broadheads available for hunting big game; five of the most common are pictured above (photo: Glen Mills; courtesy *Texas Parks & Wildlife* magazine). A hooded quiver (left) will keep broadheads razor sharp and also protect you from being cut accidentally (photo: Tom Wilcox).



In addition to practice and physical conditioning, other preparations for the hunt should begin months in advance. Scouting for sign, learning the terrain and becoming familiar with the habits of animals are important. It is also essential to know the anatomy of each animal you will hunt—a point stressed in the bowhunter education course—so that you will know where to aim for the quickest, cleanest kill. Unless the arrow severs the spinal column, an animal will rarely drop in its tracks. Therefore, you must know where the vital organs, major arteries and bone areas are located. The lungs are the best vital hit, resulting in a good blood trail. Even with a good hit, you should wait 20-30 minutes before starting to trail. An animal hit in the intestinal area should be left for about six hours before any attempt is made to track it. Unless they are pressed, wounded animals rarely travel more than a few hundred yards before bedding down; once they bed down, the hunter's

chances of recovering them are much greater.

Bill Wadsworth, chairman of the National Bowhunter Education Program, claims that women make better trackers than men. His reasoning is that they are more perceptive of details. So, if you are having difficulty trailing an animal, get some help, preferably female! Diligent searching on hands and knees has resulted in the recovery of many wounded animals.

When an animal is recovered, immediate field dressing and care are important, since the weather in archery season is usually warm. Proper cooling of the meat is essential to prevent spoilage. This may even require boning out the meat and putting it in game bags. Scott Koelzer, nationally known bowhunter and secretary of the Montana Bowhunters Association, believes that more game is lost during snowy conditions than during warm weather. This occurs, he believes, because during warm weather the possibility of spoilage is foremost in everyone's mind, while with snow on the ground the cold snow is thought to cool the animal. In reality, the snow covering acts as an insulator

and, rather than extracting body heat, holds it in.

Whether you are fortunate enough to harvest an animal or not, you will immensely enjoy the time you spend bowhunting. Archery season usually begins in early September, when the foliage has taken on its autumn hues, the elk are bugling and the birds are preparing to migrate. A camp by a stream-fed lake teeming with brightly colored brook trout, mountain peaks reaching toward the heavens and the camaraderie of an evening campfire are all part of the bowhunter's world.

Other forms of hunting undeniably offer a greater chance of bagging an animal—to some, the yardstick of hunting success. But success for a bowhunter might mean just getting close to his quarry without being detected. It is exciting to know you have done everything right, even if you don't get a shot. Who knows, maybe next time old "mossy horns" will allow you those few extra seconds needed for a clean release—thus providing the thrilling culmination of many hours of practice and planning.

But the biggest thrill is just being out there. As world-famous archer Fred Bear put it, in his book "Hunting the Quiet Way": "Memories that live are quiet ones of chipmunks, clouds, chickadees and a pounding heart when a deer or rare bird comes into view. Actual killing of the game is only a small part of the total experience." ■

A Few of Our Favorite Things

Many of those who spend time in the outdoors rate Montana's rivers among their "favorite things."

The rivers are living communities—migrating ducks, nesting geese, a waterfowler waiting with baited anticipation on a quiet backwater, a deer hunting for stealthily through a willow thicket, a fisherman watching for the perfect sight, sound and

become some of our "favorite things" become some of your favorites, too.

(photo: Matt Fischer)



The Catchall

When the System Breaks Down

A good-sized crowd was cheering a rodeo rider astride a twisting Brahma bull, when a burly spectator sitting a couple of rows ahead of me tilted his cowboy hat back. I felt a little uncomfortable as the man turned in his seat and I caught a glimpse of his face. Mr. Jones! I could see him now, standing in my office, pushing his black hair back with a massive hand and greeting me with a booming voice.

There are days in everyone's life when the system breaks down, when everything has left-handed threads and the normal course of events turns about, regardless of how hard one tries. Like when three Dodger runners found themselves on third base. Like when Cornwallis woke up and found he had to surrender to Washington. Like when Dewey woke up and found he had to phone Truman. And like that day I talked to Mr. Jones and Mr. Smith.

"HOW'S THE HUNTING BEEN

"DEER HUNTING." In the small office, Mr. Jones' roar sounded like it was resounding off the walls of a very deep canyon.

"You're looking for a place to go?"

He wiped the bottom of his nose with a fast sweep of his hand. "YOU BET. I'D LIKE TO FIND A PLACE WHERE I CAN GET A NICE MULEY BUCK."

"All right," I said, matching his vocal enthusiasm, but at a reduced volume. "I'll get a map and show you a good place to hunt."

I reached for a recreation map and circled a choice piece of deer country. "Now, when you hunt this area," I advised, "you're going to have to get out of your vehicle and walk the coulees to find a nice buck."

"WELL, THAT I CAN DO!" he bellowed.

When Mr. Jones finally left my office,

and what he did. His scuffed shoes, whipcord trousers and a torn leather jacket didn't provide much of a clue. Some might have labeled him an ordinary tramp, but something about him didn't fit the term.

"A little nippy out there this morning," I said.

"Yes sir," he said softly. "I'm Smith. Can you tell me where I might go to find a turkey?"

Turkey hunting ranks as one of my top priorities in life and I replied, "Sure, I'll be glad to show you a couple of good spots." I dug out some maps and prepared to point out some turkey havens. As I talked, he moved around my desk and leaned over my shoulder. When he spoke, I could feel his breath on my ear. "How do you hunt turkeys in the fall?" he whispered, as if we were discussing a top military secret.

I stepped back and gave him some basic pointers about autumn turkey hunting. "Be alert and prepared to do a lot of walking. And be patient," I advised.

I didn't think Mr. Smith's chance of bagging a turkey was that great. Somehow, he didn't quite fit the picture of a turkey hunter—at least not the kind I conjured up in my mind.

About four months after the hunting season had ended, I attended a local rod and gun club's banquet. After the speakers had their say and the numerous door prizes had been distributed, we adjourned to the basement for a generous Dutch lunch.

After going through the food line, I carried my plate over to one of the tables. Just as I was about to sit down, I felt a forceful slap on my back and a clap of thunder exploded in my ear, "MR. WALCHECK, I WASN'T TOO PLEASED WITH THAT DEER HUNTING SPOT YOU SENT ME TO."

There was no mistaking that voice. It was also pretty clear that Mr. Jones had adequately lubricated his vocal cords at one of the local pubs before coming to the meeting.

"Is that so? Well, I'm sorry to hear that."

"BY GUM, I WALKED MY TAIL OFF, UP AND DOWN THE COULEES, AND I COULDN'T DO BETTER THAN KICK UP A COUPLE OF FORKHORNS AND SOME DOES."

I settled down into my chair, hoping the floor would swallow both me and it. A



graphics: Vern Craig

THIS YEAR?" bawled Mr. Jones. His voice matched his appearance—big, wide, solid.

As I pushed my chair away from the desk, I felt like I was trapped in a kettle drum and somebody was beating on it with a baseball bat. For a moment, time seemed to stand still. Our secretaries in the main reception room stopped typing and a couple of hunters purchasing licenses lifted their heads in anticipation.

I looked up at Mr. Jones' frame towering above my desk. "Well, not too bad," I replied. "Hunting has been pretty good around here. What kind of hunting are you thinking about?"

he left my head ringing too. Yet, I was fairly certain he would have a good hunt if he was willing to get out and do some walking.

That same morning, I was reminded that life is full of contrasts—especially when one switches from a champion shouter to a whisperer with a hint of a lisp.

About an hour after Mr. Jones left, a middle-aged, stoop-shouldered man paused at the door to my office, raised his hand in greeting and smiled. It was a warm smile, one guaranteed to break down any barrier.

I couldn't help wondering who he was

sudden silence came over the basement as sportsmen pricked up their ears, hoping for better things. There is nothing as fascinating as the woes of another hunter—especially when that hunter has received advice from a “fish ‘n’ game man.”

“Well, by golly, sometimes the best of hunts turn out that way.”

Although I knew Mr. Jones didn’t hold anything against me personally, I did wish he would turn down the volume and not let the whole world know about the trials of that particular hunt.

“BLISTERED MY FEET. FELT LIKE A WALKING HULK OF SKIN AND BONES BY THE TIME I FINISHED WITH THAT COULEE.”

Scratching my ear to buy myself a couple of seconds, I nervously stole a look at the attentive listeners. Their grinning faces were keyed in readiness for the cat to pounce on its prey. “Well, I *did* warn you that you would have to do some walking,” I said. “Now, I really should go and see about. . . .”

“A REGULAR GRAND CANYON THAT PLACE WAS, AND WHEN I GOT TO THE TOP, I SAT ON A PRICKLY PEAR. TOOK THE MRS. BETTER THAN AN HOUR TO PULL ALL THE BLIGHTERS OUT. NEVER, NEVER, DID I FEEL SO MISERABLE!”

“By golly, I really don’t know. . . .”

“WELL, I HOPE THE NEXT HUNTER YOU SEND THAT WAY WON’T HAVE TO GO THROUGH WHAT I DID!” With that, he turned and headed for the refreshment booth.

A wave of relief came over me as I sat down and took a sip of coffee. Suddenly, I felt a gentle tug at my sleeve. Turning, I saw Mr. Smith grinning at me.

“Now what,” I thought, assuming the worst.

“Mr. Walcheck,” he murmured, “I want to thank you for the information you passed on to me last fall on where to go turkey hunting.”

“You’re certainly welcome, Mr. Smith,” I said loudly, hoping somebody would pick up on our conversation. Here was a hunter appreciative of the information I had given him, and I wanted all of the sportsmen to know about it.

Pushing my chair back and hoping that such a move would make Mr. Smith talk louder, I asked, “Did you get a good-sized tom?”

Mr. Smith walked over to my chair and leaned over. We were almost nose to nose and he spoke so quietly that I could hardly hear him say, “Ah, that I did.”

“I didn’t quite get all of that. Can you speak a little louder?” I glanced up at the surrounding sportsmen to see if any were listening, but they were all busy with their own conversations.

“I want to tell you that I really enjoyed that experience. When I saw that tom, the adrenalin raced through my body. It was like nothing I had ever experienced.”

As the din in the basement increased, Mr. Smith moved in even closer. “I think your department is doing a tremendous job in managing our turkeys and I can’t

thank you enough for your advice. That experience added a new dimension to my life.”

Unfortunately, not a single other person heard Mr. Smith’s remarks. But I did, and that was thanks enough.—*Ken Walcheck, Region 7 (Miles City) information officer*



Profile of a Snowmobiler

The Department of Fish, Wildlife and Parks is responsible for providing opportunities to a variety of recreational interests. Knowing as much as possible about the characteristics and preferences of our state’s outdoor enthusiasts is a key to successfully serving them. As a result of new legislation, in 1977 the Montana Department of Fish, Wildlife and Parks was charged with new responsibilities in the administration of a statewide snowmobile program. At that time, we knew little about snowmobiling or snowmobilers.

At about the same time, the Parks Division, through the Statewide Comprehensive Outdoor Recreation Plan, began a winter recreation survey. With this survey, we hoped to determine preferences, opinions and characteristics of Montana’s winter recreationists. This was not a snowmobile survey, but it did provide a great deal of information about snowmobilers.

In reviewing results of the survey, a “snowmobiler” was considered to be anyone who indicated he or she had snowmobiled three or more times in 1977. This group was compared to the entire survey group, or “the average citizen.”

To determine the recreational preferences of Montanans, we asked for an indication of the number of times survey respondents participated in specific activities during winter 1977 and throughout the year. In reviewing responses, it be-

came obvious that snowmobilers in Montana are more recreation oriented and more willing to try and participate in a variety of outdoor recreation activities than the average citizen.

Although Montana snowmobilers prefer mechanized recreation, the survey also showed they are more apt to participate in nonmechanized activities than the average citizen.

Respondents were asked if they had participated in a wide range of specific activities in 1977. Survey results indicated snowmobilers were more likely than the average recreationist to have participated at least once in all winter activities surveyed. Specifically, snowmobilers tobogganed two and one-half times as much, hunted predators twice as often, went ice fishing or camping nearly twice as often and observed wildlife one and one-half times more often than the average recreationist.

Snowmobilers were also more likely to have participated in the nonwinter activities surveyed. For example, Montana snowmobilers rode a trail bike three times as often, rode a horse twice as often and hunted birds and big game, boated and camped one and one-half times as often as the average Montana respondent.

In an attempt to discover opinions, patterns and characteristics of Montana recreationists, several other questions were

asked.

Since snowmobilers in Montana and elsewhere have often actively campaigned against formal wilderness designation, many people assume they are unappreciative of the values wilderness offers. To the contrary, however, the survey showed snowmobilers preferred—and were more likely to seek—recreation opportunity in undeveloped wilderness settings than the average recreationist.

Many people also assume snowmobilers enjoy the sport only because of its speed and thrills. While Montana snowmobilers agreed theirs is a thrilling sport, the survey showed that 94% prefer to participate in outings with large groups or families.

Montana snowmobilers were more inclined to believe improved recreation facilities were needed. (At the same time snowmobilers were telling the department they needed improved facilities, the Montana Snowmobile Association was successfully initiating legislation providing .3 of 1% of the statewide distributors' gasoline tax for public snowmobile facilities. This percentage was upped to .5 of 1% by the 1979 legislature.)

Montana snowmobilers are more likely to live in a rural environment, be retired and come from a large household than the average respondent.

In 1977, 140,000 Montanans—or 20% of the state's population—snowmobiled one or more times! Some 120,000 residents—or 17% of the population—snowmobiled three or more times. In terms of total participation by Montanans 18 years or older, more participated in snowmobiling than in downhill or cross-country skiing.

Montana snowmobilers were willing to travel 149 million miles in pursuit of their sport. This compares to the 187 million miles downhill skiers traveled and the 70 million miles cross-country skiers traveled. In terms of direct expenditures, Montana snowmobilers in 1977 spent approximately \$45.5 million, downhill skiers \$75.2 million and cross-country skiers \$16.2 million.

The ability to work with recreationists in solving the problems they encounter and trying to enhance their enjoyment depends on sound knowledge of their behavior and aspirations. Despite this seemingly simple observation, many of us tend to stereotype recreationists on the basis of incomplete information. While the Montana 1977 winter survey cannot be viewed as all-inclusive and its information doesn't necessarily apply to other geographical areas, it *does* represent an objective attempt to gather facts. The survey has helped to improve the working relation-

ship between Montana's snowmobilers and the Department of Fish, Wildlife and Parks.

In summary, it shows that, as a group, snowmobilers are actually the same people the department has always served—hunters, fishermen, and those who generally enjoy recreating in Montana's unparalleled outdoors.—*Ron Aasheim, project coordinator, Montana Snowmobile Program, Parks Division; G. Wesley Burnett, assistant professor, Department of Recreation and Park Administration, Clemson University; Clemson, S.C.*

Book Reviews

ALONG THE TRAIL, photography by Danny On, text by David Sumner, Glacier National History Association, Inc., in cooperation with The Lowell Press; Kansas City, Mo., 1979, 113 pages, \$20 hardbound, \$10.95 paper.

This volume is subtitled, "A photographic essay of Glacier National Park and the Northern Rocky Mountains." In addition, it is a portfolio of outstanding photographs depicting what the outdoors is all about. The book is divided into three sections: "Prairie," "Forest" and "High Country."

The "Prairie" section features American bison, monarchs of the range; the fleet antelope, the mountain lion, various birds, the Columbian ground squirrel and reptiles, such as the painted turtle. Intermingled with the photographs and text describing these inhabitants of the prairie are more pictures and words describing the wildflowers found from the prairies to the edge of the Rocky Mountain forests. An outstanding photograph marks the transition between the "Prairie" and the start of the "Forest."

The "Forest" section comes alive with wildlife photographs and spectacular mountain scenes—the majestic moose of Glacier National Park, elk, mule deer in alpine splendor, grizzly and black bear, not to mention the wily coyote and the chipmunk, the smallest member of the squirrel family. The mountain scenes are enough to take your breath away, but perhaps Danny On's real talent emerges in the various wildflower photos in this section, such as the one of the mountain lady slipper.

As the title implies, "High Country" comprises photos of the top of the world in Glacier National Park and the creatures and plants that inhabit the "special clarity" there. This section is replete with shots of bighorn sheep lambs, ewes and rams, as well as photographs of the pika, a "pint-sized alpine rabbit"; mountain goats, the gray jay and others. In my

opinion, the winter shots of the ptarmigan are among Danny's finest wildlife transparencies. In addition, there are alpine flower gardens in full bloom against a background of cascading water, primitive lichens and an alpine marsh, the "center of dazzling mountain color."

Not to credit David Sumner for his accurate and immensely readable text accompanying and enhancing Danny's superb photographic images would indeed be remiss.

"Along the Trail" is a book for all ages, guaranteed to whet and heighten your awareness of the great outdoors. It is not to be read and discarded, but to be kept on a handy bookshelf for future spiritual uplifts. It is also a fitting memorial and tribute to Danny On's special skills.—*Lou Kis, Region 1 (Kalispell) warden captain*

YELLOWSTONE SKI TOURS, by John F. Barber, Rocky Mountain Trading Co., Yellowstone National Park, 1979, \$3.95, paper.

"The thermal activity in this area is the result of surface water seeping into the mountain side where it is heated by molten rock less than two miles down. As it rises back toward the surface, the hot water often dissolves the underlying limestone and then redeposits it at the surface in the constantly changing travertine terraces."

This excerpt from the section on Upper Terrace Loop Drive near Mammoth Hot Springs is typical of John F. Barber's style, and most of this tiny book is descriptive as well as informative. The author briefly sketches an area and allows much to the imagination of the tourist, although he discloses some relatively private sections of the park. Barber's advice is to be well prepared, check in with park personnel and leave a trip plan, keep a respectful and safe distance from wintering herds and leave the winter woods and meadows as you find them.

continued

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He details over 35 short, medium and long tours and provides a tantalizing taste of Yellowstone's nearly infinite cross-country possibilities—with something for everyone, from novice to hard-core Nordic-downhillers. Sketches of reference maps are included, but the author warns against depending on them in the back-country.

Due to dry conditions in 1979, only limited snowmobiling was allowed. Yet, plenty of cover was available. Ranging from sunburn to frostbite, this is an unforgiving land to visit in winter and only the hardy traveler or photographer prepared for cold should venture past the gates. Those who cannot or will not obey the natural laws of cold and wind will suffer and may lose toes or worse. The park itself surrenders to the season and only those creatures who accept and adapt to the weather will survive.

Although somewhat costly for its 10- by 15-centimeter size, the book is useful. The sharply printed words on warmly textured white pages are like ski tracks cut across snow on a sunny day. Drawings are simple and effective. Color World of Montana (Bozeman) has done an excellent job of printing, showing reverence worthy of the topic.

This nifty tour guide can lead you to elk, bison, antelope, coyotes, hot springs and petrified trees. Plus, it is printed on 100% recycled paper.—*Marlin Stum, free-lance writer and reviewer; Red Lodge, Mont.*

LEWIS AND CLARK COUNTRY, photography by David Muench, text by Archie Satterfield; Robert D. Shangle, Beautiful America Publishing Co., 1978, 140 pages, \$25 hardbound.

"Lewis and Clark Country" is the type of book which belongs on the coffee table, out in plain view, to be picked up time and time again. Unlike many of the books reviewed in *Montana Outdoors*, this one does not tell the reader how to do something, where to go or the whys of a specific topic. Instead this is a book of appreciation, of wonderment, of realization. Through the artful eye of his camera, David Muench takes the reader on a visual trek—from St. Louis to the Pacific Ocean—with photographs that enable one to see the land from the vantage point that

Lewis and Clark may very well have had. The photographer has expended great effort to visually present the rivers, plains and mountains as they were at the time of the expedition.

To read excerpts from the journals as one examines the photos brings a full meaning to each location. At five appropriately selected locations throughout the book, Archie Satterfield writes of the explorers' day-to-day achievements, defeats, agonies and conflicts. This book will provide a better understanding of the travels of the 1804-06 expedition. It will enable you to sit back and enjoy these lands of the Missouri, Yellowstone, Snake and Columbia. "Lewis and Clark Country" is likely to do what only the best of photographs and text can do—leave you wanting to learn more.—*Michael Gurnett, motion picture production unit*

COMING INTO THE LIGHT, By Barrie Rolleston Cannon and George Cannon, Voyager Publications, Inc., P.O. Box 229, Lansing, NY 14882, 1979, 96 pages, \$12.95 plus \$1.50 postage, softbound.

Barrie Rolleston Cannon and George Cannon, a husband/wife photography team, have extended an invitation to you by way of a very eloquent book, "Coming Into the Light." That invitation is one of reacquaintance and revival with nature. "By sharing with you some brief moments in our own experience, and the borrowed words of a few eloquent and sensitive authors," write the Cannons, "we hope to stir within you some curiosity, some need. We hope to kindle within you a desire to know the beauty of nature that lies so close around you. It is yours for the meager exchange of a few moments spent with open eyes and receptive mind."

The text is simple and thought provoking, with quotes from such "eloquent and sensitive authors" as Ralph Waldo Emerson and Henry David Thoreau. And the photography is splendid, ranging from subtle—as with a mist-shrouded lake—to shots bursting with color—like autumn leaves. The Cannons have gone beyond photographing the obvious lush forests or sparkling lakes. They have taken their camera into the essence of nature to catch a drop of dew on a leaf, or to find mushrooms hidden under a forest floor of decaying vegetation.

"Coming Into the Light" graciously accomplishes its goal of being an invitation to the reader. The beautiful meshing of text and photos is definitely an incentive to get out of the living room and into the wilds. This book is for those whose world is not entirely "ruled by schedules, time clocks and deadlines," but a world where there is time to be one with nature, to touch, to feel and to walk nature's paths.—*Donita Sexton, art director*



in a series from the
National Shooting
Sports Foundation

Know What's Beyond Your Target

For the big game hunter, the ability to accurately estimate the distance to a target can make all the difference between a successful shot or one that does nothing more than throw up a cloud of dust.

From a safety standpoint, a knowledge about a different kind of distance is equally important: the maximum range of various center-fire bullets. For instance, did you know that a 220 grain slug fired from a 30-06 can travel some three miles? That's about 5,000 yards or 15,000 feet. However you look at it, that's a long, long way. A 100 grain slug from a 243 Win. has a maximum range of some 12,000 feet. That's 40 football fields laid end to end.

The maximum horizontal distance to point of first impact of some other popular center-fire cartridges includes:

Cartridge	Bullet Wt. in Grains	Distance in Feet
222 Rem.	50	7500
270 Win.	150	13000
30 Win.	170	11000
300 Savage	180	12000
30-06 Spfld.	180	12500

Whether you're after woodchuck or Wapiti, the fact these figures underscore is that the bullet you fire can travel far beyond the target area. Not only must you be sure of your target, but also what lies beyond it. Always know that you have a safe background before firing. Remember, firearms safety depends on you . . . make no mistake about it.

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Decoy Renaissance

by Roger Fliger

The "Tule Eater" Indian bound bullrushes in the likeness of a canvasback; the old market hunter applied his rasp to a block of cottonwood; the young farm boy attacked a cedar fence post with his whittling knife. They all had one thing in common: the result of their labor was a decoy capable of luring waterfowl within range of an arrow or shot charge.

In museums, in antique displays and in the collections of private individuals, decoys of almost every imaginable material can be found, fashioned in the likeness of nearly every edible species of wild bird. Most of these decoys, work-worn veterans of such waterfowl bonanzas as the Mississippi, the Platte, Chesapeake Bay and Currituck Sound, were "retired" after World War II, when factory methods became available for mass-producing inexpensive, lightweight decoys from plastic and papier-mache.

Interest in handmade decoys, however, has enjoyed something of a renaissance in recent years. A few outdoorsmen are once again fashioning their own working decoys, not because it is cheaper or more practical, but because of the satisfaction they get from seeing a flock of mallards pitch into a spread of decoys they have made with their own hands.



These people belong to a group of sportsmen/craftsmen who enjoy reloading their own shells, tying their own flies and checkering their own gunstocks. In other words, they derive pleasure from creating their own sporting tools by hand, taking pleasure in the process and pride in the product.

But interest in decoys is taking yet another form in America today. A growing number of people—rightfully called artists—are hand-carving and painting decorative decoys. These perfect replicas, usually carved in lifelike postures and sometimes standing on carefully proportioned feet and legs, are authentic even down to the intricate feather details.

Perhaps the old decoy carvers, whose products were designed to ride rough water, resist breakage, and withstand the ravages of ice and snow, would scoff at these modern birds, which, after all, will ride only fireplace mantles. But I have a feeling that the oldtimers, who loved waterfowl and knew more of their habits than most modern-day hunters, would find an artistically rendered replica of a canvasback or curlew as irresistible as we do today.

How does one get started in the fascinating pastime of decoy carving? You can start with the simplest of tools: a sharp knife, a whetstone, some sandpaper and some glue. A coping saw, glue clamps, hand drill, small hatchet, rasp and draw-knife can also help the beginner. Jig and band saws, rifflers, wood chisels and electric drills can be added later.

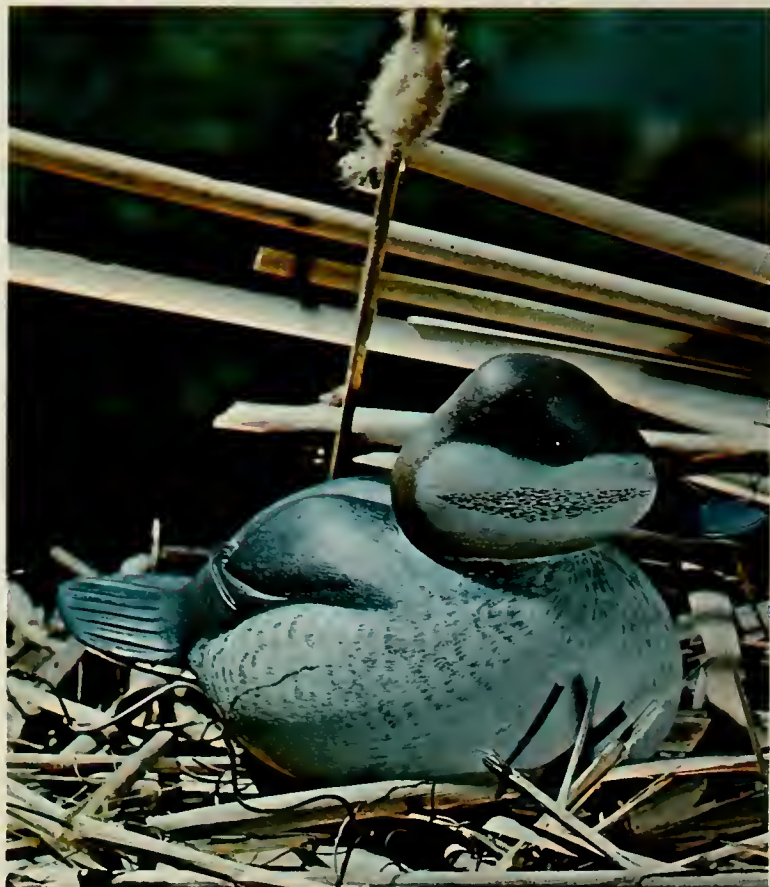
Balsa is a practical wood for beginners to start on. It is easy to carve, and general bird anatomy can be mastered more readily working with it than with harder woods. Other woods frequently used by carvers are linden (basswood), white-cedar, white pine, sugar pine and cottonwood.

Color photographs, mounted birds or birds taken during hunting season can be used as reference material for getting accurate measurements, proportions and colors.

Several books are also available on decoy carving, including "How to Make Working Decoys," by George Ross Starr, Jr., M.D. (Winchester Press); "The Art of Bird Carving," by Wendell Gilley (Hillcrest Publications, Inc.); and "Game Bird Carving," by Bruce Burk (Winchester Press).

Aside from the materials mentioned above, plus some oil paints or acrylics to apply the finishing touches, you will need only liberal amounts of patience and leisure time.

Whether your objective is a set of handmade "blocks" that will draw in flocks of waterfowl on set wings, or a lifelike decoration for your den or living room, decoy carving is a rewarding hobby. ■





Decorative decoys have become artistic masterpieces, the result of painstaking attention to detail. Dr. Jim Kehr (opposite page, above), Helena area chairman for Ducks Unlimited, puts the finishing touches on a mallard decoy. The lifelike greenwing teal (below) are also from Dr. Kehr's collection (DFWP photos: Tom Warren). The mallards (above) and the ruddy duck (opposite page, left) were done by Nebraska carvers Ralph Stutheit of Lincoln and Bob Havel of Norfolk (photos courtesy *NEBRASKAland* magazine). The canvasbacks on the preceding page are the handiwork of Great Falls decoy carver Larry Roberts (DFWP photo: Tom Warren).





ENJOY!

Enjoy seems a fitting way to suggest how to look at the work of photographer Harry Engels. A full-time professional working out of Helena, Harry's work has appeared in a variety of publications, including **Audubon**, **National Wildlife**, **Natural History** and many times in our own pages.

Harry's interest in photography grew out of his work with the Forest Service over 20 years ago, first in Idaho, then in Montana. His work involved a lot of backpacking, and the camera became a natural way of recording what he saw: wildflowers, streams, lakes, forests and high country. A few years later, Harry began acquiring telephoto lenses to photograph wildlife, toward which most of his work is now geared.

The stunning photographs on the following pages are a result of a two-fold approach. First, says Harry, "I read books and magazine articles to learn as much as possible." Then it becomes a matter of getting out to the wildlife. For Harry, this is usually accomplished by excursions ranging from day hikes or overnight trips to extended backpacking efforts. "I am willing to go to great lengths and suffer under a heavy load to get the pictures I want. Few people on a pleasurable backpacking trip are willing to do that."

Thanks Harry, for your painstaking efforts. The results are truly ours to enjoy!





The male blue grouse (far left) can be found in Montana's coniferous forests. A large grouse, dusky grey to blackish in color, the blue grouse sports an orange-yellow comb over the eyes. During spring courtship, the male produces "booms" or "hoots" by inflating and deflating

the sound-magnifying pouches on each side of his neck.

One of North America's largest birds, the trumpeter swan (above) sometimes weighs as much as 28 pounds. Close to extinction in the 1930s, the trumpeter has made a

successful comeback, partially because of establishment of Red Rock Lakes National Wildlife Refuge in 1935. Situated in south central Montana's Centennial Valley, the refuge has become a prime nesting and wintering ground for the majestic trumpeter swan.



Rarely seen except by hikers and campers, the yellowbelly marmot (left) inhabits western Montana's rocky areas and mountains. Weighing from five to 10 pounds, the yellowbelly is part of the squirrel family. It feeds on a wide range of grasses and forbs, and has a special fondness for alfalfa.

The Shiras moose (below) is the largest member of the deer family found in Montana. Inhabiting forested lakes and swamps, the Shiras browses on accessible shrubs and trees in winter, supplemented by aquatic vegetation in summer. The earliest written accounts of moose come from the journals of Lewis and Clark, where two sightings—near the mouth of the Milk River and near present-day Lincoln—are recorded.





Photographer Harry Engels on location with his swamp blind photographing birds. The blind consists of a small tent about 4½ feet tall with a small folding stool inside for the photographer. The tent has various zippered openings for observation and picture taking.

A rather small white heron, the snowy egret (right) has a slender black bill, black legs and yellow feet (sometimes referred to as "golden slippers"). Showy white plumes on the egret's head are usually spread when the bird alights.

During the breeding season, the plumes are also present on the foreneck and back. Habitat for the snowy egret includes marshy areas near freshwater lakes, ponds and irrigated land.



Readers Respond

We Do Not Exist For Ourselves Alone

My brother and I have hunted in your beautiful state twice now, and have mostly loved it. We were in the Bob Marshall Wilderness and the beauty was breathtaking. We saw many signs of elk and I was just climbing a mountain toward an opening in the trees when I spooked a herd of elk. I had planned on going to that spot before daylight the next day and maybe staying a couple of days, but we were told not to use that road any more because previous rains had weakened it. It was disappointing, but I still felt lucky to have spotted a herd on my trip there as a rookie elk hunter.

After a few days, we decided to go for mule deer in the Charles M. Russell National Wildlife Refuge. My brother got one both times we were in your state. I wasn't so lucky, but I saw many mule deer, enjoyed watching the antelope and loved all the snooping in the gullies. It really was hard work, but I loved every minute of it and we intend to come back.

I read two letters in the March/April 1980 issue of *Montana Outdoors* that prompt me to write about our bad experiences in your state. It was in traveling to different areas trying to find a place to hunt. The letter from Tony Garibaldi of Bozeman is one that really hit the nail on the head. I can't tell you of all the miles we drove looking at all that prime hunting area, not knowing who to ask if we could hunt. (We traveled on back roads.) There either are "No Trespassing" signs or people passed the buck, denying ownership of any of the land.

In some cases, we were treated unkindly when others noticed our license plates. We ran into four hunters from California who swore they would never return for the same reason. My brother and I are conscientious hunters and we have hunted for 30 years and have never run into anything like this. As Mr. Garibaldi stated, the money hunters have ruined it for everyone else.

Hunting by helicopter, plane or snowmobile is not hunting in my book. The animal hasn't a fighting chance. To me, the challenge in hunting is to see what one can accomplish on foot. Where is the challenge of hunting from a plane or snowmobile? Where money is involved, people lose their reasoning, and their hearts where wildlife and the rights of others are concerned.

This brings me to the letter from

Michael Lyngholm of Dillon, who seems to favor so-called "development," which in most cases means "tear down some more wilderness so we can make money by building for man's wants and 'needs'."

If Mr. Lyngholm and others like him would *really* look around, they would all see how man has encroached on our wildlife. Whether he likes it or not, wildlife does have a right to some kind of peace and contentment. Haven't we asked for the same? People invade the animals' habitat and wonder why the animals feed on our crops (we took their feed away from them), why the meat eaters go after our fowl or sheep (we destroyed the areas which kept the smaller feed animals around) and why so many animals are killed on roads and highways (we built roads through their roaming territory). We invade their areas and then cuss them out for being there.

I do think we should quit all this and, for a change, give them a fighting chance.

If it weren't for dedicated people, most of the birds and animals we take for granted today would not exist. Then we would really be crying out about the waste and abuse brought about by those who have gone before us.

I love to hunt, and I enjoy just looking at our beautiful animals. I also enjoy a meal of venison or rabbit or pheasant and I hope someday to be lucky enough to enjoy a meal of elk meat, but I believe all of us should keep our needs and wants in their proper perspective.

We do not exist for ourselves alone.
—Mrs. Lena Gorski; Milwaukee, Wis.

Prairie Chicken Remembrance

Your magazine, *Montana Outdoors*, is very enjoyable and I was particularly interested in Ken Walcheck's article on prairie chickens (March/April 1980).

I would like to tell you of a sighting. In August 1970, my wife and I were driving from Wisconsin to Havre and Shelby. A school chum of my wife's lives in Havre and we were visiting there and driving to Shelby later, where my wife's father lived at that time. (Her parents had homesteaded near Kremlin.)

We stopped at Fort Peck Dam, parked the car and watched a covey of prairie chickens on the near shore within 20 feet of us. There were five birds in the flock;

later they flew away.

I grew up in Mountain Lake, Cottonwood County, Minn. My father was an avid hunter of ducks and prairie chickens and had a pointer and later an English setter. I can remember riding in a one-horse buggy, my mother driving while my father hunted the fields with his dog. This was about 1913, and chickens were very numerous then. Later, when I was 10, I hunted with him on stubble fields and wild prairie sections owned at that time by Thompson Lands. This was the beginning of the end of the prairie chickens in that area.

In 1932, I came to Rhinelander, Wis., to practice and hunted sharptails near our city. Every once in a while, we would get a prairie chicken. Now both species are down and I don't hunt them anymore, but still hunt ruffed grouse and ducks.

I am sure the birds I saw at Fort Peck were prairie chickens and called to my wife to look at them because of their rarity. I hope this information might be helpful in Mr. Walcheck's investigation.
—Dr. C. P. Goossen; Rhinelander, Wis.

An Unpleasant Picture

Montana is such a beautiful state—not just because it's my home, but because it is truly beautiful. And it bothers me as I drive across the state to see so much blight, all caused by people, distracting highway travelers.

I'm talking about signs painted on rocks and entire hillsides, cuts for road fill scarring panoramas, houses built in the middle of historic and scenic passes, skid trails reaching to the edge of the highway and refuse from landfills blowing for miles in the borrow pits. I could continue, but I'm sure you get the unpleasant picture.

Perhaps in future issues you could suggest ways readers can confront such blight. In the meantime, thank you for showing off the beauty of our state.
—Jeffrey Dietz; Missoula, Mont.

Well Worth \$1

I would like to compliment you for the excellent work between the covers of your Special Hunting Issue. Each article was very well written and the articles made me realize that each one of us, hunter and nonhunter, needs to become more involved in conserving our great outdoors.

I personally am going to do more than I have toward the conservation effort. For

one thing, I am going to let everyone I know, hunter and nonhunter alike, share the special issue of your magazine.

It was well worth the dollar I paid for it.—*Eddie Webster; Victoria, Tex.*

Beautiful Indian Pipe

I was so delighted to see your front cover photo of the fragile, beautiful Indian pipe. Long ago, back in the forest across from our farm in Oregon, my mother discovered a small group of these plants at the base of a large fir. She guided me through the brambles, plants and trees—and there they were. I have never forgotten the beauty of the moment, and neither has she.

Unfortunately, she later took our neighbor lady to see the plants and even though Mom warned her about their delicacy, she sneaked back and dug them up for herself. My mom and I were heartsick, the plants promptly died and none ever grew there again. I've never seen Indian pipe since, so I especially appreciated the beautiful picture in your magazine.—*Mrs. William Argall; Great Falls, Mont.*

Of Walleyes and Turkeys

Springtime in Montana offers many activities, especially to those of us suffering from cabin fever.

In the Helena area, we are blessed with a large stretch of the Missouri River, its impoundments and the great trout fishing found in these waters. At times, the angling here can be nothing short of fantastic. But enough trout fishing is enough.

Spring fishing belongs to the walleye, indeed a rare catch today and a species here (along with the burbot or ling and the catfish) before the dams were built. Why hasn't an effort been made to improve the walleye fishery right along with the trout fishery? In many areas, both do well in the same waters.

The pine forests along the Missouri's banks hold another possible spring activity. A fair number of wild turkeys is found here. Why hasn't something been done to better protect and improve the number of these birds so a spring hunt could be held here?

Anyone who has ever had a strutting gobbler come to his call or tasted fresh walleye filets will understand what outstanding sport they are. So why is it that a person has to drive all day to get to an area where one of these species is abundant when they could and should be found right here around the capital city?

With today's spiraling gas prices, Montana's wide-open spaces are too big for many residents to cross in order to enjoy the resources.—*Jim Vralsted; Helena, Mont.*

•*Montana's fish hatchery system is*

geared to the production of trout. The only warm-water fish hatchery in Montana is the federal hatchery at Miles City. The water supply there is erratic and while some walleye and northern pike fingerlings are normally produced, there is no assured supply of eggs of these two species within Montana. However, we usually produce more rainbow trout eggs at the Arlee hatchery than we need and thus have trading stock for other species. Almost every year we receive some walleye and northerns, both for introduction as fry and for rearing to fingerling size at Miles City. However, our top priority uses for walleye and northerns are in waters in eastern Montana similar to their native habitat and where there is a possibility they will reproduce naturally.

Of the three species you mentioned, only the burbot (ling) is native to the Helena area. Both the channel catfish and the walleye's close cousin, the sauger, are native to the lower Yellowstone and Missouri drainages but are not found above the Great Falls of the Missouri. The walleye is not native to Montana, but has been introduced into a number of waters.

Habitat, not the Montana Department of Fish, Wildlife and Parks, determines where turkeys will exist in Montana. The department has planted turkeys just about everywhere in Montana where the habitat looked even marginal. They "took" in the places where they now exist.—Ed.

Guest Editorial

The "Backcountry Concept": A Positive Viewpoint

The backcountry concept should be considered within a broad framework—the outdoor recreation opportunity spectrum. The spectrum idea emphasizes the need for a range of recreational opportunities and lands managed to provide these opportunities. The spectrum stretches from highly developed, intensively used campgrounds to undeveloped, lightly used wilderness. The two ends of the spectrum have received a great deal of attention over the years, but a whole series of intermediate opportunities deserve more attention than they often have received.

The spectrum concept rests on the simple fact that people have different preferences, abilities and needs, all of which vary at different times. A person may want to fly-fish a wild stream sometimes and take the kids worm fishing in a man-made lake another time. *One activity is not better or worse*

than the other—only different. Either can be a low- or high-quality experience.

Wilderness is the anchor point of one end of the spectrum. Wilderness is an important, essential part of a full range of recreational opportunities, but it is not automatically "the best."

The Wilderness Act of 1964 is subject to different interpretations, but to many of us, it says the main objective of wilderness is to preserve sizeable areas where natural ecological processes can work with as little human interference as possible. Maintenance of natural processes, whatever they bring, is the objective, not maximizing numbers of elk or cutthroat trout, nor preserving any particular environmental conditions.

While protecting the natural processes, wilderness is also intended to provide people a chance to enjoy it *as wilderness*, to the extent possible. The Wilderness Act lists "outstanding

opportunities for solitude" and "primitive and unconfined recreation" in the definition of wilderness. However, some wilderness areas are closed to all recreational use (several wildlife refuge wildernesses), emphasizing that recreation is not the dominant reason for designating wilderness. Many areas limit the number of visitors to protect natural conditions and to provide some chance for solitude.

If this is what wilderness is, or should be, some people think that, in addition to wilderness, roadless lands managed primarily for recreation are also needed. (In fact, Bob Marshall took this position over 45 years ago when he proposed two types of wilderness, one stressing primitive recreation and the other emphasizing primeval natural conditions.) In these recreation areas, instead of trying to let nature always have its own way, managers could

deliberately create and enhance recreation opportunities. Depending on the area, for example, this might mean increasing elk numbers by improving habitat through periodic burning; fencing and improving pastures for visitors' horses; building small lakes behind natural looking earthen dams and stocking them regularly with fish; opening vistas from key points on trails, and, if desired, providing more campsite facilities, such as hand pumps, fire grates or toilets.

Backcountry is largely a concept, not an existing system. But a few places, such as the Jewel Basin Hiking Area east of Bigfork in northwestern Montana, fit this category. Such areas are usually referred to as "backcountry," but that is not an official title, as is "wilderness."

Several different categories of

to some enjoyed in wilderness, as well as some experiences of a slightly different type. Our research shows a substantial proportion of the present visitors to wilderness would probably enjoy backcountry more. Through more intensive management, more recreational use per acre could be provided in backcountry than in wilderness. Facilities and practices that are inappropriate in wilderness—such as planting resilient but non-native grasses—could help avoid the need to limit numbers of visitors, as might be necessary in wilderness.

Finally, backcountry could help protect wilderness by providing an attractive alternative that could draw some use away from wilderness, particularly types of use that might put an extra strain on wilderness, such as very large groups, semipermanent hunting camps or people primarily interested in catching fish.

The advantages of managing some land as backcountry and some as wilderness seem substantial to me, but several issues and problems must be considered.

First is the purity versus flexibility issue. It is hard to imagine "purity" being a dirty word, but for some wilderness advocates, it is. The issue here is not how altered a piece of land can be and still be "pure" enough to be designated wilderness, but how "pure"

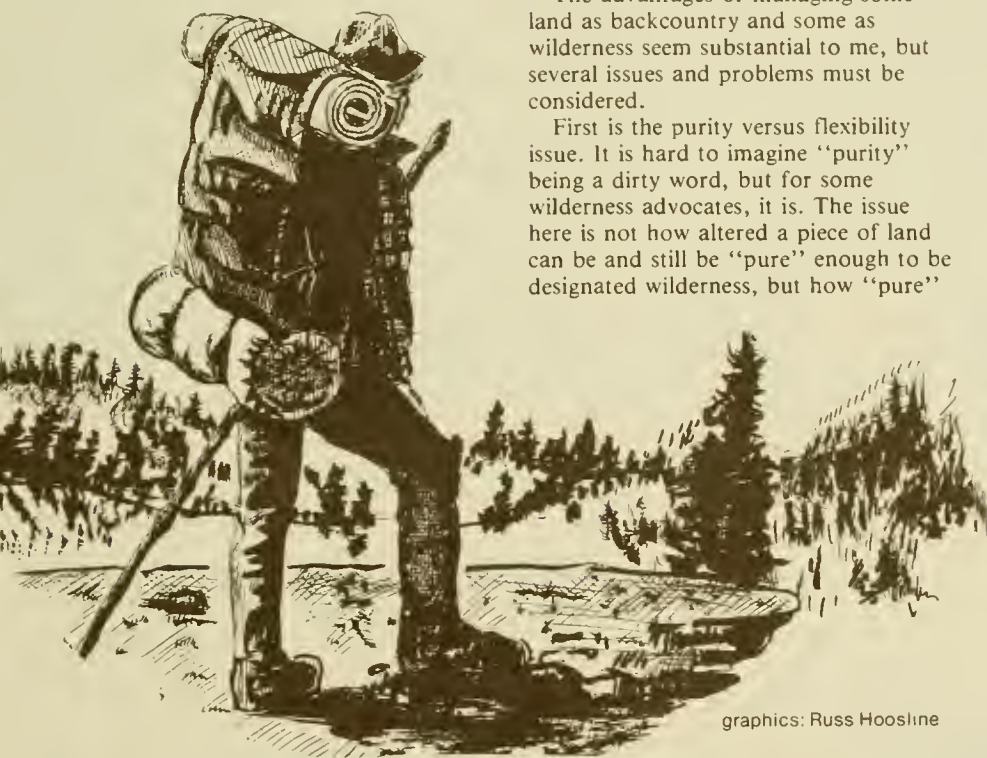
replace it. We will have a backcountry system called "wilderness," but little or no true wilderness. Many people who, as our research shows, prefer less developed, lightly used wilderness will have no place to go.

Permanence is another issue. Wilderness is established by Congress; backcountry is not. Backcountry could be legislatively established, if that is the public's desire. The Wilderness Act could even be amended to provide for zoning some areas as "pure" wilderness and some as what I am calling backcountry. But legislation is no guarantee of permanence. What Congress classifies it can declassify, and might quickly do so—for example, if major oil reserves were discovered in a wilderness. Even without legislative designation, in this era of the National Environmental Policy Act, an agency cannot change an established management direction quickly. Impact statements are required; they take time and give everyone a chance to influence decisions.

Should only lands not qualified for wilderness be considered for backcountry? Is it a case of backcountry versus wilderness? Land qualified for wilderness *must* be considered for all types of alternative uses. Surely, backcountry is the least drastic change possible, compared to road development and logging. Why should the choices be unnecessarily polarized? Some land that qualifies as wilderness might better be managed as backcountry in order to meet the needs and desires of people. No one would ever say, "Land suitable for tennis courts should never be used for softball fields."

A final problem is the lack of a clear definition of backcountry. This is true now. All of us—the public, land managers and researchers—should work together to define management approaches to meet our needs, to meet the land's capability and to fit into other programs. Whether this involves a case-by-case approach or a more comprehensive backcountry system is one of the issues to be worked out. If we want a range of opportunities available in roadless lands, the alternatives must be faced and choices made. What kind of wilderness do we want, and what kind of backcountry?—*Bob Lucas, project leader, Wilderness Management Research, Forest Service*

•For another perspective, see "The 'Backcountry Concept': A Wilderness Viewpoint" in the Sept./Oct. 1979 issue of *Montana Outdoors*. This earlier guest editorial was prepared by Bill Cunningham, regional representative of the Wilderness Society.—Ed.



graphics: Russ Hoosline

backcountry could be designated depending on the capabilities of the land, the needs and desires of people and alternative areas available. Some back country might permit trail bikes or snowmobiles. (Mechanized recreation is not permitted in wilderness.) Again depending on the situation, backcountry might permit nonrecreational uses, such as grazing, mining or water developments, under less restrictive policies than wilderness. (None of these uses is absolutely prohibited in wilderness.)

Backcountry could provide high-quality recreational experiences similar

or strict management should be for land already in the wilderness system. "The Wilderness Act permits more flexibility than managers recognize," some say. Maybe so. But we can't have our cake and eat it too. If we water down our wildernesses to make them more inviting recreational areas, easier and more convenient to visit and easier for commodity interests to use, natural ecological processes will be substantially altered. The chance to experience a wilderness as wilderness and to find outstanding solitude will slip away. The anchor point on the opportunity spectrum will be lost and nothing will

Contributors

Special thanks to **Kelly Vollrath** of Great Falls for this issue's cover art. Done with colored pencil, the antelope illustration was prepared especially for *MO*. Thanks also to **Larry Thompson** for another of his appropriate pen-and-ink illustrations, this one accompanying "The Editor's Column." And also to **Russ Hoosline** for his illustration (page 25) accompanying the guest editorial which begins on page 24.

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One cannot tell the history of Montana without also telling the story of its rivers. As **Larry Peterman** writes, the rivers "provided the early routes to funnel trappers, traders and settlers into a virgin territory and to return the pioneers' trading stock downstream to eastern markets." Of course, settlement came; and when it did, it followed the water courses. When railroads replaced rivers as the most popular means of transportation, rivers in the state assumed new roles as "providers of water for fish, wildlife, cities, agriculture, hydropower and recreation." But Montana's waters are vulnerable and, as Peterman emphasizes, the most important and difficult aspect of protecting a river is protecting the water itself. Yet, that is exactly what must be done if we are to have "Water for the Future." As the water resources supervisor in the department's Ecological Services Division, Peterman's grasp of the problems facing Montana's water resources is extensive. Turn to his article on page 2.

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"Hunting the Quiet Way" is a title we borrowed from a book by Fred Bear in which he says, "Memories that live are quiet ones of chipmunks, clouds, chickadees and a pounding heart when a deer or rare bird comes into view. . . ." If your preferences run toward golden days and quiet stalks through the autumn woods—and if bagging an animal isn't your primary measure of success—bowhunting may be your kind of sport. **Don Hettinger** and **Judy Casanova** attempt to answer some of the questions a novice bowhunter might face—such as what kind of bow to buy, how to choose arrows, how to select a quiver and more. Hettinger is the state bowhunting education chairman and a member of several bowhunting groups and associations. He and his wife own and operate an archery shop and both serve as bowhunting education instructors. Mrs. Hettinger's assistance and ideas are also reflected in the article. Co-author Casanova was a *Montana Outdoors* intern in spring 1979. She is currently county

government and court reporter and education editor for the Idaho Falls Post-Register. Their article begins on page 6.

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Find someone who reloads his or her own shells, ties flies and refinishes gunstocks and you're also likely to find someone who is contributing to the "Decoy Renaissance." Many of those who carve their own decoys also deserve to be called artists, since what they create are waterfowl in lifelike postures, sometimes standing on exactly proportioned feet and legs and authentic even down to intricate feather details. **Roger Fliger's** article, beginning on page 15, provides some hints on how to get started and the titles of several helpful reference books. As he writes, "Whether your objective is a set of handmade 'blocks' that will draw in flocks of waterfowl . . . or a lifelike decoration for your den or living room, decoy carving is a rewarding hobby." Fliger, the department's supervisor for the Billings region, is an avid collector and carver of decoys. For additional information, see his earlier article, co-authored with Larry Roberts, "Decoys: American Originals," in the Nov./Dec. 1979 issue of *MO*.

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If you're a regular subscriber to *MO*, then the photography of **Harry Engels** has no doubt captured your attention. If you're new to the magazine, let "Enjoy!" serve as an introduction to Engels' perceptive eye. A full-time professional photographer, his work has appeared in *Audubon*, *Natural History* and *National Wildlife*. Engels' approach is to learn as much as possible about his subject and then to go to it—this involves anything from an overnight trip to an extended backpacking expedition—to obtain the exact result he demands. For a showcase of his work, turn to page 18, and also to our back cover.

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"Play by the Rules and Enjoy the Game" is excellent advice for any hunter, but the advice is particularly sound when applied to hunting antelope. As **Bart O'Gara** writes, too many neophyte antelope hunters are introduced to the sport by chasing animals with vehicles and long-range "flock shooting." This kind of behavior lends credibility to the propaganda of anti-hunting groups and impairs landowner/sportsman relations. Instead, O'Gara urges hunting pronghorns on foot and points out that antelope hunting is an ideal situation for teaching a young sportsman hunting ethics, the close

stalk and the clean kill. Sidebars accompanying the article provide helpful hints on field care, how to make jerky and how to choose a trophy pronghorn. Dr. O'Gara is the leader of the Montana Cooperative Wildlife Research Unit. He has hunted pronghorns for 35 years and the reproductive physiology of the species was the subject of his doctoral dissertation. Fifteen years of subsequent part-time research have resulted in 15 technical publications on antelope and six theses by Dr. O'Gara's master's students. Turn to his article on page 27.

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"Dolly Who?" Dolly Varden, that's who. But they're also called bull trout. But they really aren't trout at all, they are char. Confused? Turn to **Pat Graham's** article on page 34 and you will learn how this colorful, freshwater predator got its name and a great deal about its life history. Bull trout provide a trophy fishery in Flathead Lake, with the largest recorded catch weighing over 25 pounds and measuring over 42 inches long. But will the Dolly Varden survive the threats to its future existence? Hungry Horse Dam alone resulted in a habitat loss that may have been as high as 60% of the total for bull and cutthroat trout in the South Fork of the Flathead River. Oil and gas exploration along the Flathead's Middle Fork, coal development along the river's North Fork on the Canadian side and possible damming on the lower ends of both the North and Middle forks all pose threats to the future of this delicately colored fish. Graham is the project leader for the Fisheries Division's study of the Flathead River Basin. He has worked as a project biologist on department research at Kootenai Falls and along the lower Yellowstone.

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It's that time of year when home owners with fireplaces or wood stoves head toward the nation's national forests for firewood. Last year, Montana's 10 national forests provided 231,000 cords of wood and some ranger districts issued more than 2,500 permits. **Jud Moore's** article tells you what to cut, how to stack it, how various types of wood burn, how to build a more efficient fire and other information that might just lower your winter fuel bills by a few dollars. An accompanying sidebar defines the different types of cords and what to expect when you order wood. Moore is an information officer at the Forest Service Northern Region Headquarters in Missoula. Turn to his article on page 36.

Play by the Rules and Enjoy the Game

by Bart O'Gara

Early in this century, the antelope was considered finished as a game animal and seasons were closed in the United States and Canada. Today, antelope are second only to white-tailed and mule deer as the most numerous big game animals in the United States. More pronghorns were shot annually in Wyoming during the 1960s and early 1970s than existed in the whole world during 1924. This has been a remarkable achievement by wildlife managers—bringing a big game species from the brink of extinction to abundance, within the span of a human lifetime. Without the cooperation of many ranchers and money provided by sportsmen through licenses and Pittman-Robertson funds, it couldn't have happened.



In spite of continuing loss of habitat, pronghorns now thrive. They have been restored to most of the suitable range, although man-made barriers prevent their old free movements across the prairies, as described by Teddy Roosevelt. Because they reproduce rapidly and lack vast expanses for migration, control of their numbers by hunting is needed to reduce crop damage and prevent die-offs during severe winters or droughts.

Pronghorns provide the only chance most Americans ever have for a big game hunt on the prairie. When seeking a first antelope, deer hunters soon discover a different kind of hunting. Deer are neutrally colored, blending into their habitat, but pronghorns, with their contrasting colors, are sharply visible. Although mule deer share parts of antelope range, they usually shun the open terrain where antelope thrive. Deer use cover and stealth to escape danger; pronghorns avoid cover and depend on speed. Deer rely primarily on hearing and a keen sense of smell, but pronghorns trust their extraordinary sight.

Too many neophytes are introduced to antelope hunting by chasing animals with vehicles and long-range "flock shooting." Living in open country, antelope are easy to see and, unfortunately, easy to chase with a vehicle. Their habits of racing with and crossing in front of moving objects, their penchant for open ground and their reluctance to jump fences all favor the thug on wheels. This sort of hunter, besides being a poor sport, lends credibility to the propaganda of anti-hunting groups which consider all hunters inhumane.

Over the long haul, the tolerance of landowners will determine how much land will be available, both to pronghorns and to hunters. I have talked with ranchers who would like to be rid of antelope; some were altering fences and watering tanks to eliminate pronghorn populations. Competition for forage and damage to standing grain were occasionally given as reasons, but antelope hunters were the ranchers' main complaint. Hunting without permission, leaving gates open, littering, shooting in the vicinity of livestock and driving off-road across ranges and pastures were common offenses. Slob hunters endanger both the sport and (to a lesser



When stalking pronghorn, how close a hunter should try to get for a shot depends on his own ability (both as a stalker and as a rifleman) and on the terrain. With today's weapons, a 300- to 400-yard shot from a steady rest at a standing animal is reasonable, providing the hunter is a good marksman, knows his rifle and can judge distance (photo: Jon Cates).

extent) the animals themselves. This is unfortunate and ironic, because an antelope hunt is the ideal situation for teaching a young sportsman the ethics of hunting, the close stalk, the clean kill.

The most satisfying way to hunt pronghorns is on foot, and this involves more than simply walking around the countryside. "How-to" hunting stories might seem more appropriate in commercial hunting and fishing magazines than in *Montana Outdoors*; yet many hunters evidently believe that pronghorns can only be hunted by vehicle, so perhaps a "how-to" is in order.

The antelope hunter should carry a flat-shooting rifle, equipped with a scope of 4X or more and a sling. A range-finder reticle (dot or double crosswire) is helpful, as are the flattest trajectory loads available and bullets that expand rapidly against light pressure. Good lightweight binoculars of 7X or 8X are next in importance, and the trophy hunter should also have a spotting scope. For crawling over sharp rocks and cacti, stout leather gloves and stretch knee pads will soon seem like lifesavers. The rifle itself

should be sighted in just before each hunt.

Above all, the hunter should contact local ranchers in the area to be hunted. Most federal land is open to the public, but driving to it on a private road constitutes trespass. Even where public roads lead to public land, one should show the courtesy of checking with the rancher who runs livestock on that land. Sometimes there are good reasons why a herd of livestock should not be disturbed by anyone. When properly asked, most Montana ranchers will allow hunting on their property, and many even volunteer directions to where antelope can be found.

Under the right conditions, stalking, "flagging," walking down and waiting in ambush can all afford standing shots at pronghorns. But, in my opinion, stalking is by far the most sporting and enjoyable way to hunt these prairie speedsters.

Because I enjoy stalking so much, I avoid the opening day of antelope season. Almost everyone with a license gets an animal the first day or the first weekend of the season. Hunters seem to be everywhere, and they

usually interrupt the best planned stalks. Most animals are shot as they move away from another hunter and for this type of kill, little skill is required. A week or two later, the antelope country is almost deserted. The animals are spooky, but that adds zest to the sport. Planning and executing each stalk may take half a day or more and only a good stalker will get within 200 yards of even half the pronghorns he tries for—it is a very satisfying way to hunt.

That hunter who sees his game before being seen holds the trump cards. To accomplish this, the hunter must avoid the tops of ridges and hills. Because these animals notice objects on the skyline at tremendous distances, the stalker must never glass from the tops of ridges and must cross them only where saddles or notches exist. The hunter should watch carefully for any game that may be just over the crests, then settle down behind rocks or bushes and glass all of the terrain in sight. He must take ample time; frightened pronghorns flash white, but bedded ones are hard to see. Although the country may look flat, little draws and undulations can hide a whole herd. The longer he glasses, the greater the chance that an animal may move out of such a hiding place. In big country, it is worthwhile to set up a spotting scope for scanning distant ground.

Pronghorn hunters have less trouble with being scented by the game than do other big game hunters. In open habitat, sight is more important than scent, and the prairie winds shift less than those over rough terrain. I hunt into or across the wind most of the time, but on a circular hunt—from a vehicle and back to it—the wind is sometimes at my back. This reduces the chance of surprising animals within rifle range, just over ridges or in pockets. The chances are still good of spotting game at a distance, however, and then maneuvering to make the stalk into the wind. Although pronghorns are instantly alerted by human scent and become extremely difficult to approach, they usually do not bolt.

Nor does sound often stampede any but the most skittish pronghorns—but many have been alerted by the slamming of car doors and the rattling of binoculars against gun barrels. Like most big game, pronghorns



Choosing a Trophy Pronghorn

The official scoring system of the Boone and Crockett Club is the standard method for determining excellence of a trophy. Parameters considered are length and circumference of the horn, length of the prong and symmetry between right and left horns. Personnel of the Department of Fish, Wildlife and Parks can tell a hunter how to contact the nearest official measurer, as can most taxidermists. The hunter can also write directly to Boone and Crockett Headquarters, care of the N.A.B.G. Awards Program, 1600 Rhode Island Ave. N.W.; Washington, D.C. 20036.

Choosing a good pronghorn head is not easy. Thin horns of about 13 inches, with small prongs, are common on 2-year-old bucks. They are hardly trophies, but to the untrained eye, they may look pretty good in the field. Heavy horns of 14 inches are decent trophies, 15-inch horns are good and anything over 16 inches is probably record class, provided the prong is also sizeable.

If the horns were straight, judging them would be easier—but the shape of the hook at the top of the horn makes a big difference in measurements, and the trophy hunter must consider the total conformation of the horns. The serious trophy hunter should look at as many mounted heads as possible, try to judge them by eye and

then measure them to check his guesses. Most horns are deficient in one way or another: For instance, bucks frequently have good bases, but prongs topped by only small hooks. Only by looking at great numbers of heads and pictures of heads can a hunter get a feeling for conformation.

Hunters interested in first-rate trophies should use spotting scopes to check heads at a distance and should memorize the following measurements: An ear is five to six inches long; a buck's head is about 13 inches long from the tip of the nose to the back of the head, and the distance from the tip of the nose to the corner of an eye is about eight inches.

First, look for a good prong. If the length from back of the horn to the tip of the prong is equal to the length of an ear, the prong is good to excellent. The curve of the hook makes the length of a horn greater than the distance it stands above an animal's head. For example, a fairly straight horn is about two inches longer than its height, whereas a sharply curved horn may be five to six inches longer than its height. Well-shaped horns standing nearly as high as the length of the head should thus be record class, and even straight ones of that size are good trophies. Prongs differ in their locations along the lengths of horns; but in really good trophies, tips of the prongs are at least a nose-to-eye length above the eyes. If the hooks are correspondingly large, it is a good trophy.

The trophy records are interesting and serve as standards for comparison. Many of the highest scoring heads are really freaks of nature, however, and hunters should not feel that heads that fail to make the book are second-rate trophies. An average buck—if hunted on foot, stalked fairly and dropped painlessly with one shot—is more of a trophy than the largest head in the world, if taking that head involved pure luck or an unsporting hunt. I keep small and medium-sized horns and antlers that remind me of enjoyable and exciting hunts.



Field Care of Pronghorn Meat

Like any big game animal, a pronghorn must be gutted immediately after the kill. But cutting the throat or sticking an animal that has been dead several minutes accomplishes little, and every cut in the field results in wasted meat. Make cuts by slicing from the inside of the skin outward, to avoid cutting hair into the meat.

After removing the viscera, turn the carcass belly down, preferably over some brush, to let blood and body fluids drain, while you retrieve the liver and heart from the viscera. I carry a 2½-gallon plastic bag to hold the liver and heart, and place one or two cups of water in the bag to dispel heat and keep the organs from drying out. I leave the bag open except when carrying it.

After the carcass has drained, turn it belly up and wipe it out with a wet cloth. Then wring out the cloth and wipe the body cavity dry. Prop the carcass open for at least an hour to dispel heat and allow a

dried surface to form on the meat. If a carcass must be left in the field for any reason, it should be turned belly down to protect the meat from carrion-eating birds.

During most hunting-season weather, pronghorns are small enough to cool in the field without skinning. However, the brisket and pelvic girdle should be split, preferably with a saw, as soon as the carcass has been moved to a dirt-free location. Leaving the skin on a pronghorn until just before cutting up the meat prevents waste from drying and dirt. If you prefer to skin the animal immediately, carry a cotton bag large enough to hold the whole carcass, and let the carcass air dry for at least an hour before placing it in the bag.

Even when meat feels cool to the touch, it is not ready to be carried anyplace, except in the open air, until the surface is dry. *Never* carry a carcass on a hood or fender next to the engine or on "hot spots." (Pickup truck boxes, trunks and floors of vehicles often have hot spots over tail pipes or transmissions.) *Never* carry a carcass in the trunk of a vehicle on the day the animal was killed, except in an ice chest. A cartop carrier is best for transporting fresh meat. When a carcass is carried inside a vehicle or pickup canopy cover, windows should be open so that air circulates around the propped-open carcass. I may be beating this issue to death, but too much good meat is spoiled by improper cooling.

For most red meat, a week or two of hanging is recommended. But the fine-grained meat of pronghorns is tender when fresh, and aging is not required.

are spooked by the sound of *hurried* movements, whether those movements are made by their own species or another. The person who rushes from ridge to ridge spreads fear before him, and gets more exercise than game. But a slow-moving hunter who stops often to use binoculars makes noises of movement similar to those of a feeding animal. If they do not see or smell anything strange, even unfamiliar sounds sometimes prompt antelope to investigate.

Once pronghorns are located, the hunter should watch them long enough to determine what the animals are doing, and whether a particular animal among them warrants a stalk. If the group is moving, a quick stalk-and-wait interception is often possible. I once got within 10 yards of unsuspecting antelope in that way. If the animals are bedded, it is time to plan the stalk.

Undulations in the ground will usually allow a circuitous approach, out of sight of the animals and into or across the wind. Walking almost any distance while screened from pronghorns will prove more effective than trying to cross even small openings within their sight. Crawling on hands and knees, or even on one's belly, is good for the final 200 yards or so, but it is tiring and time consuming to crawl for a longer distance. After just a short crawl, the average hunter will be too winded for a steady shot, and it takes some moments while lying in a cramped position to get one's breath back.

Yet even while making a long approach, the hunter should remain prepared to set himself for a careful shot. More than once, pronghorns have come to meet me as I was stalking them. I never knew whether they had seen or heard something suspicious, or just happened to move in my direction. Usually, they caught me by surprise and were on the run before I was ready for them. In such instances, the hunter should not try to get the rifle off his back quickly. Unless startled, the animals will stay until their curiosity is satisfied, often allowing time for the rifle to be inched around into shooting position.

Circling behind a ridge or going up a draw or creek bottom are the handiest ways to get within crawling distance. Crossing an opening in sight of



In spite of continuing loss of habitat, pronghorns now thrive. Because they reproduce rapidly and lack vast expanses for migration, control of their numbers by hunting is needed to reduce crop damage and prevent die-offs during severe winters or droughts (photo: Jon Cates).

pronghorns can only be done flat on one's belly, and *slowly*. Watching a cat stalking a bird gives one an idea of how slow the movement should be. Resist the temptation to lift your head for a look, or to raise your buttocks for faster crawling.

Those who lack either the time or the physical stamina to hunt all day on foot miss much of the thrill and satisfaction of antelope hunting. Yet a successful hunt is still possible without chasing animals or shooting from vehicles. Glassing from high points on roads or taking short walks to check the far sides of ridges are tactics that often reveal antelope. And if a hunter wants to stalk animals he has noticed from a moving vehicle, the best bet is to drive on out of sight without changing the sound of the engine, then walk back, re-locate the game and plan the stalk.

The "flagging" of pronghorns has received considerable attention from outdoor writers, as a supposedly easy way to get a standing shot at a buck—but in my experience, this method has not proved particularly effective as a hunting technique. For summertime photography, I *have* occasionally been able to bring young animals and territorial bucks into camera range by flagging. The best results were obtained by approaching up a draw toward the animals' vicinity, hoisting a white handkerchief on a stick where they could see it, then moving 50 yards to one side so the curious animals would not be looking right at me. Sometimes they came to inspect almost immediately, sometimes after a couple of hours (and frequently to within 50 yards of the handkerchief)—but most often, they did not come at all.

My lack of success in flagging pronghorns during the hunting season is undoubtedly related to the fact that I hunt in heavily hunted areas after the season has been open for a week or more. On a private ranch or other lightly hunted area, the method might be worth trying, and a handkerchief hoisted on a rifle barrel



Pronghorn Venison

Like the little girl of nursery rhyme fame, when pronghorn meat is good, it can be very, very good; but when it is bad, it can be very, very bad.

Usually, pronghorns have fine-grained, tender meat with an excellent flavor. Yet some pronghorns are nearly inedible—even though the meat has been cared for and cooked properly. No one seems to know why the flavor varies so.

Pronghorn meat should be handled and cooked just like good beef. Pronghorn chops, fried fast on a very hot skillet with a small amount of grease until pink in the center and well browned on the outsides, are delicious. Livers are much like young calf livers—best if fried very fresh and slightly rare. For some reason, pronghorn hamburger makes better meat loaf than beef hamburger. The round steaks are rather dry, but they can be tasty with salt, pepper and flour pounded into them. For those who like fat meat and do not worry about cholesterol, pounding ground beef suet into antelope round steaks makes them difficult to distinguish from beef. The fat of antelope, as of most American big game animals, is tallowy and should be trimmed off. Roasts are

improved by the addition of pot liquor, and commercial *au jus* mixes add both moisture and flavor.

Smoked antelope jerky makes excellent hors d'oeuvres, provides good lightweight protein for hunting trips or backpacking and can be prepared from an animal whose meat is not especially good. Still, only choice cuts should be used, since sinewy meat makes unchewable jerky and serves better for salami or wieners.

Directions for preparing jerky:

1. Cut the hams or loins into one- by two-inch strips *with* the grain of the muscle, in the longest lengths each muscle allows.

2. Prepare brine in a granite or crockery roaster or bowl, using one cup of Morton Sugar Cure (available at most supermarkets) to one gallon of water. If sugar cure cannot be obtained, make the brine with ½ cup table salt, ½ cup brown sugar and ½ teaspoon *each* of ground black pepper and ground allspice.

3. Soak meat in the brine overnight (12 to 14 hours).

4. Remove meat from brine, rinse lightly in cold water and drain for one to two hours.

5. Smoke meat for eight to 10 hours in medium-hot smoke. I use one of the small commercial electric smokers, set in a large cardboard box (to increase the heat), and add three pans of wood chips at two- to three-hour intervals.

6. When the meat comes from the smoker, the pieces should be rubbery and bend easily. Place on cooky sheets for one or more days until drying is complete. As soon as the meat is dry enough to crack when bent, place it in plastic bags or jars and store in the refrigerator. Such meat will keep for a year when refrigerated and two to three months in a backpack. When serving as hors d'oeuvres, cut it into thin slices across the grain of the meat.

might save the day when further inconspicuous crawling is impossible.

Walking down is a challenging way to take one of the big old bucks that stays out in open flats where stalking is impracticable. In the flat country of eastern Montana, on two occasions I walked down large bucks that seemed impossible to approach any other way. (Before attempting this method, the hunter should realize that 10 miles and half a day are about the average walk for such a hunt, that the presence of other hunters in the area may preclude success and that, if successful, he may have to carry his kill a long way back to a road.)

After locating a pronghorn, the hunter slings his rifle and walks slowly toward a spot several hundred yards downwind from the intended prey. It's best not to look at the animal directly or make any unnecessary movements. As the hunter comes into view, the antelope usually becomes fidgety and watches until its pursuer is within 500 yards; then it runs off for one or two miles. The hunter has simply to turn and follow.

Often, crossing a ridge, the pronghorn will switch directions when it can see what is on the other side, so the hunter must watch closely. While a ridge separates him from the animal, the hunter can walk as fast as he wants, but when breasting the ridge, he should resume his slow walk toward a spot downwind from the antelope. The animal will usually allow the hunter to get about 30 yards closer at each approach and will tend to flee a shorter distance each time. Ten walks should put the rifleman within 200-250 yards of his target—about as close as can be expected. On the final approach, the hunter should go to a fence post or other handy gun rest, smoothly unsling the rifle and shoot without delay. He should not go into a prone or sitting position for his shot because the animal has become accustomed to seeing him upright. I carry a walking and shooting stick in my left hand so that, with or without fences, I can shoot any time.

Waiting at crossings, at the edges of grainfields, in little wet seeps with green vegetation, or at waterholes has provided close shots for many hunters. The better one knows an area, the better this waiting game can be played. Pronghorns disturbed by hunters tend

to run in certain patterns: down the middle of broad valleys, through low saddles, along the sides of ridges—and seldom *across* a steep ridge, unless hard pressed. A pile of rocks or a brush patch on the point of a ridge or overlooking a saddle can be a good hiding place. But remember, don't skyline yourself.

In some places, antelope habitually duck under fences. These crossings are easily recognized by tracks, hair on the bottom wires or broken wires. Waiting in a patch of cover within 50-100 yards of such a crossing can be an especially deadly technique when other hunters are moving game about. This is not my kind of hunting, but it undeniably takes patience. A certain excitement builds as one watches game come to the gun, always knowing the animals may veer off before the critical moment. At any rate, waiting is preferable to joining the crowd on opening day. And it's a good method for archers or anyone hunting with a muzzleloader.

Waiting at water holes or feeding areas seems, to me, a little unsporting. But this too is effective when few other hunters are in the area. Unlike many big game animals, antelope drink and feed at intervals throughout the day, so the hunter using this method must remain alert at all times.

When stalking pronghorn, how close a hunter should try to get for a shot depends on his own ability (both as a stalker and as a rifleman) and on the terrain. With today's weapons, a 300- to 400-yard shot from a steady rest at a standing animal is reasonable, providing the hunter is a good marksman, knows his rifle and can judge distance. He should know up to what range he can hold every shot within a 10-inch circle and not be tempted to stretch his luck beyond that range. Range is deceptive on prairies and deserts, especially for hunters not accustomed to the country or the game. A crawling hunter with his eyes near the ground is at a particular disadvantage in estimating distances. Bright sunshine, clean air and the animals' gleaming white hair often combine to make pronghorns appear much closer than they are. Conversely, at dawn or dusk or on a stormy day, antelope seem to shrink or fade, appearing farther away. (For those using a range reticle, adult bucks measure about 17 inches from

top of back to belly, and does one or two inches less.)

An unhurried, long-range standing shot is more reliable than a running shot, but I prefer crawling to within 150 yards or less before shooting. The real excitement of the stalk occurs in the final approach, and shooting at greater distances amounts, for me, to admitting I cannot get closer. Besides the thrill of a close stalk, there are other advantages. Paramount is placing the shot for a quick painless kill, but also, at closer range, the trophy hunter can more accurately assess the head, and the meat hunter can avoid the loss of meat.

Offhand shooting at pronghorns is usually unnecessary and foolish. The open country lends itself to prone or sitting shots; rocks or fence posts sometimes offer handy supports. I wish everyone used single-shot rifles so that more hunters would be careful on the first shot. A one-shot hunt in Wyoming, stressing the sporting aspect of the chase and playing down the kill, has attracted many enthusiasts, and the success rate has been high.

The only time a hunter is justified

in shooting at a running pronghorn is, I believe, when the animal has been crippled. Admittedly, rolling a running antelope at 200 or 300 yards is a thrill. But before trying it on anything other than a wounded animal that might otherwise escape, remember that a pronghorn hit in a nonvital area, whether or not it is eventually retrieved, will suffer unnecessarily. I would rather go home empty-handed than have that kind of kill on my conscience.

Stalking pronghorns is fun. The hunter can count on seeing many animals, and the excitement builds as one sneaks up on a trophy buck or a fat young animal for the table. A quick, clean kill may leave the sportsman momentarily sad at the death of a beautiful animal, but a good, honest satisfaction soon sets in from knowing that the game was played by the rules, and played well. Those who chase these interesting animals with a vehicle and who shoot at running herds not only run the risk of damaging landowner/sportsman relationships and crippling animals, they also miss one of the greatest thrills in North American hunting. ■



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AFTER THE CLIMB down from Two Medicine Pass, I stopped to relax beneath the trees. A few clumps of beargrass were still in bloom. Staring out over the lake, the reflection of the mountains was broken only when a fish swam near the surface. But there were no
Ring . . . ring.

I swung my feet off the desk as the summer sun pounded my head. I reached for the phone and mumbled, "Hello. Yes, this is Fish, Wildlife and Parks."

"You are from where? Oh, east of Nebraska. Yeah, I think I know where that's at."

"Fishing? Sure there are places to go fishing. Big fish? Yes, we have a few big fish. This time of year you can probably pick up a couple of Dollies."

"No, sir, I'm sure you are happily married. I mean Dolly Varden."

"Country western? No, sir, I said Varden. V-a-r-d-e-n. They are also called bull trout. Well, they really aren't trout either, they are char. No, sir, I said char."

"No, we don't have dumb names for fish. Well, I never thought much of crappie either."

Maybe he was right. Let's see, it must be close to sunset on Two Medicine Pass.

* * * * *

Misunderstood and often maligned, Dolly Varden have been considered an undesirable species in some areas. They have even had to survive bounty-harvesting in parts of their range where salmon and steelhead are the aristocrats of the fishery. Like most of its relatives, the Dolly is a predator; because of the supposed impact of its predation on salmon and steelhead populations, a bounty of 2½ cents per fish was placed on Dolly Varden in Alaska. During the 1930s, up to \$20,000 was paid annually in bounties as Dollies were taken in traps and weirs and destroyed by the thousands. They suffered from the same type of shortsighted human action that has plagued other predators such as eagles, wolves, lions and coyotes—their role in the balance of the natural system distorted or inadequately understood.

One might wonder how this color-

DOLLY WHO?

by Pat Graham

ful, freshwater predator became known as Dolly Varden. In the novel "Barnaby Rudge," Charles Dickens created a character named Dolly Varden, a beautiful woman with a reputation for flirting and a flair for gay fashions. Before long, Dolly Varden hats became the rage in the United States, especially one style made with a particular pattern of pink-spotted calico. Then a lady of the time—as the story goes—upon seeing a certain freshly caught fish, remarked that it must be a "Dolly Varden" trout. The label stuck, and Dolly Varden trout have continued to wear, like their namesake, delicate colors and a mixed reputation.

Dolly Varden belong to the genus *Salvelinus*, an old name for char. Arctic char, brookies and lake trout are other members of this group. Dolly Varden within this group go by the scientific name *Salvelinus malma*. To complicate things, it appears that some Dolly Varden are not really Dolly Varden at all. Recent taxonomic work has identified two separate groups, each of which merits species status within the *S. malma* classification. One is the anadromous (maturing in saltwater, returning to freshwater to spawn) form, found along the coast of Alaska and south to the state of Washington. The second form lives its entire life in freshwater, east from the Washington coast and inland to Montana and eastern Alberta. This freshwater form, distinctly more predaceous than the other, is commonly called bull trout (*S. confluentus*).

Bull trout are distributed mainly west of the Continental Divide. In Montana, their major stronghold is

the Flathead River Basin. They are found east of the divide in the upper Saskatchewan River drainage, but not in the Missouri River drainage.

Late in spring, big bulls (ranging from 16-35 inches long) leave Flathead Lake, beginning a summer-long journey to their spawning tributaries. The run to the upper forks of the Flathead River may cover 250 miles. Some bulls enter the tributaries in July and August, holding beneath log jams and overhanging banks or in deep pools. Others wait in the larger pools of the main river, moving occasionally onto shallow bars to feed on small mountain whitefish or other prey. In freshwater, these spawning adults often take on gorgeous markings: dark olive green across the back, lower sides of orange or red and, along the olive upper sides, many small spots ranging from yellow to red. Hence the comparison with cheery calico.

Spawning begins in September and is over by late October. A male and female will pair up for spawning, and the female will dig a redd (nest) in clean gravel, roughly three feet wide and five feet long. The female will not deposit all her eggs at one time, but will move forward and dig again, covering the first group of eggs, and then lay some more. She may repeat this process several times. After spawning, most adults return downstream, but because of the stress of the spawning migration, mortality may exceed 50%. Others may linger short of the lake, remaining temporarily in the river to feed on spawning whitefish and kokanee or their eggs.

Bull trout eggs remain buried in the gravel throughout the winter and fry emerge in early spring. They are a little over an inch long when they swim up from the gravel. By summer's end, they have grown to about three inches.

Juvenile bull trout share the tributary streams with westslope cutthroat trout and sculpins. The young bulls spend from two to four summers in the tributaries—feeding mainly on immature aquatic insects, and reaching six inches in length—before they migrate downstream to the lake.

Bull trout are available to fishermen much of the year. In the Flathead River, anglers can test their skill for



Lou Kis, a warden captain for the Montana Department of Fish, Wildlife and Parks, with a large Dolly Varden he labels a "keeper" (DFWP photo: Dale Graff).

the large spawners, using wet flies and spinners, from May through August. The major spawning tributaries in both the North and Middle forks of the Flathead are closed to fishing all year to protect the spawning bulls which are very vulnerable in low water. Still, poachers take their toll.

Bull trout provide a trophy fishery in Flathead Lake—the largest recorded catch weighed over 25 pounds and measured 42 inches long. A minimum size limit of 18 inches assures that sufficient numbers of Dolly Varden reach spawning age. Bull trout are caught in the deep waters of the lake through winter ice or, more commonly, on the bars or shoals where they come to feed in summer.

When Hungry Horse Dam closed its gates in 1953, it locked up the South Fork of the Flathead River. The amount of spawning habitat lost to bull and cutthroat trout from Flathead Lake may have been as high as 60% of the total. Exploration for oil and gas is now pending in the Great Bear and Bob Marshall Wilderness areas along the Middle Fork of the Flathead. At Cabin Creek, along the North Fork on the Canadian side, coal development is threatening another major spawning stream. And potential sites for major hydroelectric facilities lie on the lower ends of both the North and Middle forks. How long can Scenic River status protect those waters?

Dolly who? Bull what?

* * * * *

The sun sets softly across the crown of the continent on Two Medicine Pass. High above, water drains from snowfields as summer comes to a close. Below, grizzlies amble through berry patches, readying for winter snows.

Across the valley, tamaracks begin to signal winter's approach as their needles turn from green to gold. Dip-pers bob in the stream, flitting from rock to rock; soon, they will be heading south. Beneath the gravel lie the eggs of the bull trout. They survived the bounties, but will they survive the threats to their future existence? ■

Tips for Wood Gatherers

by Jud Moore

SOARING fuel prices are sending more and more people into the national forests for firewood. All across the country, growing numbers of home owners are using fireplaces and stoves for heating and cooking. In 1971, an estimated 200,000 board feet of firewood was taken out of the national forests; in 1979, the firewood harvest exceeded 1.6 million board feet—a whopping 800% increase!

This dramatic rise in the cutting and hauling of fuelwood is expected to continue as prices of other fuels skyrocket. Last year, an estimated half-million firewood permits were issued throughout the national forest system and another 220,000 people took firewood in areas where no permits were required. So, about 720,000 people took 1.6 million board feet of firewood—or the equivalent of 7 million barrels of oil.

In national forests in Montana and northern Idaho, the firewood harvest in 1979 reached 368,700 cords, a 13% increase over 1978. This firewood was harvested by 43,000 people, up 35% from the number of people the previous year. Montana's 10 national forests provided 231,000 cords of firewood last year and some of the ranger districts issued more than 2,500 firewood permits.

Before setting out to cut wood, obtain a map from the local forest ranger to be sure of the land ownership. Otherwise, you might find that you are not on national forest land, but are taking wood from private lands. In checking with the ranger, you can also determine if a permit is required. Permits are available year-



round and are usually good for one year. Some ranger districts require permits and others do not. Even when firewood permits are required, there is no charge if the wood is for your personal use. You can take up to 10 cords (per household) of national forest firewood each year. Most people cut wood when the weather is temperate. When possible, cut your winter supply of firewood from May through October to allow sufficient time for drying.

If you plan to cut and haul the firewood for commercial sale, you must work out a purchase arrangement with the district ranger.

CUTTING WOOD

Firewood to be gathered is restricted to dead timber, either standing or down. Logging slash can be taken and debris from past logging or thinning is a good source. When cutting a standing tree, make certain the tree is dead. Western larch (tamarack) often appear dead because the needles turn gold and are shed during the fall.

Snags provide nesting and roosting sites for birds and mammals so do not cut snags marked with a square, brown metal sign: "Wildlife Tree." Many unmarked trees are also valuable to wildlife and the most important are snags with existing nest cavities and round or triangular-shaped holes. In addition to watching for visible nests and holes used by birds, whitewash (bird excrement) around the base is another indication the tree is being utilized by wildlife.

Use of motor vehicles is restricted to designated roads in some portions of national forests. These restrictions are shown on Forest Travel Plan maps, available from the district forest ranger.

Most wood will not burn well when freshly cut. Also, green or wet wood produces smoke, soot, tars and other residues that can damage your chimney. Wood must be seasoned by drying it for several months. Splitting logs hastens drying. In storing wood: •Stack wood outside, away from live trees, to avoid the possibility of contaminating live trees from diseased or

Burning Characteristics of Common Trees

Species	Relative amount of heat	Easy to split	Pops or throws sparks	General rating
Larch (tamarack)	high	yes	yes	good
Douglas-fir	high	yes	no	fair
Ponderosa pine*	low	yes	no	fair
Lodgepole pine*	low	yes	no	fair
Cottonwood	low	yes	no	fair
Aspen	low	yes	no	fair
Spruce	low	yes	yes	poor

* These pines are the worst for forming creosote in chimneys and stovepipes.

insect-infected cut wood.

- Keep wood off the ground to prevent water absorption from the soil and decay of the lowest layers.
- Accelerate drying by stacking wood in a sunny location. Cover the stack with clear plastic.
- As a fire precaution, don't stack wood against your house.

BUILDING A FIRE

To build a log fire, place two logs on the iron grate or fire basket and lay the tinder between them. Then place a small handful of dry twigs or split softwood kindling around this. Next, place small, dry logs over the base. A tepee formation of kindling and small branch wood will ease your fire through its early combustion stages. After the logs ignite, place them close together. Narrow air spaces between logs promote better drafts and heat reflected between adjacent surfaces aids in raising and

maintaining combustion temperatures.

No more than four logs are needed to make a good fire. Adjust the logs and maintain the flames by pushing the ends into the flames from time to time. Add new logs at the rear of the fireplace so they will reflect light and heat into the room.

Ashes should only be permitted to accumulate to within an inch or two of the bottom of the grate. A greater accumulation blocks the air flow to the fire.

A fire "banked" with ashes at night (covering the burning logs with excess ashes) will hold glowing coals for eight to 10 hours, making it easier to rekindle the flames in the morning.

In summary, a woodcutter's responsibilities in the national forests include:

- Do not cut live trees.
- Keep stumps low, not more than 12 inches high.

- Remove brush and other debris from roadways and ditches.
- Do not block roads. Let others pass.
- Keep damage to the environment to a minimum.
- Stay in designated areas.
- Respect the rights of others in the area.
- Respect private land.
- Do not litter.
- Check with the ranger for permits and maps.

Most national forests of the Northern Region (Montana, northern Idaho, North Dakota and western South Dakota) have free information folders on cutting and hauling firewood. National Forest headquarters in Montana and northern Idaho include:

Bitterroot National Forest, 316 N. Third St.; Hamilton, MT 59840 406/363-3131.

Beaverhead National Forest, P.O. Box 1258; Dillon, MT 59725 406/683-2312.

Flathead National Forest, P.O. Box 147, 290 N. Main; Kalispell, MT 59901 406/755-5401.

Helena National Forest, Drawer 10014, Federal Building; Helena, MT 59601 406/449-5201.

Lewis and Clark National Forest, P.O. Box 871, Federal Building; Great Falls, MT 59403 406/453-7678.

Deerlodge National Forest, P.O. Box 400, Federal Building; Butte, MT 59701 406/723-6561, ext. 2351.

Gallatin National Forest, P.O. Box 130, Federal Building; Bozeman, MT 59715 406/587-5271.

Kootenai National Forest, P.O. Box AB, West Highway 2; Libby, MT 59923 406/293-6211.

Lolo National Forest, Fort Missoula, Building 24; Missoula, MT 59801 406/329-3557.

Clearwater National Forest, Route 4, Ahsahka Road; Orofino, ID 83544 208/476-4541.

Coeur d'Alene National Forest, St. Joe National Forest, Kaniksu National Forest, (Idaho Panhandle National Forests), P.O. Box 310, Coeur d'Alene, ID 83814 406/657-6361.

Nezperce National Forest, 319 E. Main; Grangeville, ID 83530 208/983-1950. ■

Does the Wood you Purchased Measure Up?

If you're buying wood to help trim heating bills, it pays to know what you're paying for, according to experts at the Forest Service.

Usually wood is sold by the cord or fraction of a cord. But the cord you order may not be the cord you get because there are different types of cords. There are standard cords, face cords, short cords and others.

The standard cord, which you should specify when ordering wood, is a pile of wood measuring four feet high, eight feet wide and four feet long. A face cord measures four feet high by eight feet wide, but the pieces may be any length. So a face cord of stove-length (16-inch) wood would be only one-third of a standard cord. Short cord is another way of saying "face cord."

In addition to knowing what type cord you order, be sure the pile you measure is tightly stacked, with all the wood pieces lying in the same direction. Otherwise you will pay for air space instead of wood. Even piled carefully, a cord has only 80 cubic feet of solid wood in it, although its dimensions measure 128 cubic feet.

The size and straightness of the wood in the pile have a lot to do with

how much wood you will get. Crooked pieces add to air space, but large pieces add up to more wood in the pile even though the spaces may look larger.

Pound for pound, most species of wood produce about the same amount of heat if the wood is dry. However, some species of wood are lighter than others so a cord of wood such as aspen will weigh about half as much as a cord of dry white oak and will therefore have about half the heat value (see chart).

It would seem buying wood by weight would avoid questions about piling and measuring. But practice and theory clash because wood always contains moisture. Up to half the weight of "green" wood, freshly cut from living trees, can be water. At today's wood prices, that is expensive water.

It is easy to determine the dryness of wood. You can ask the seller how long the wood was "air dried" and whether it was cut to length and split before drying. If the answers are "at least nine months" and "yes" respectively, you can assume you'll get fair heat value for the weight.—*Forest Service*



ENJOY!
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